

## **MANAGEMENT AND PERFORMANCE**

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## MANAGEMENT AND PERFORMANCE

### OVERVIEW

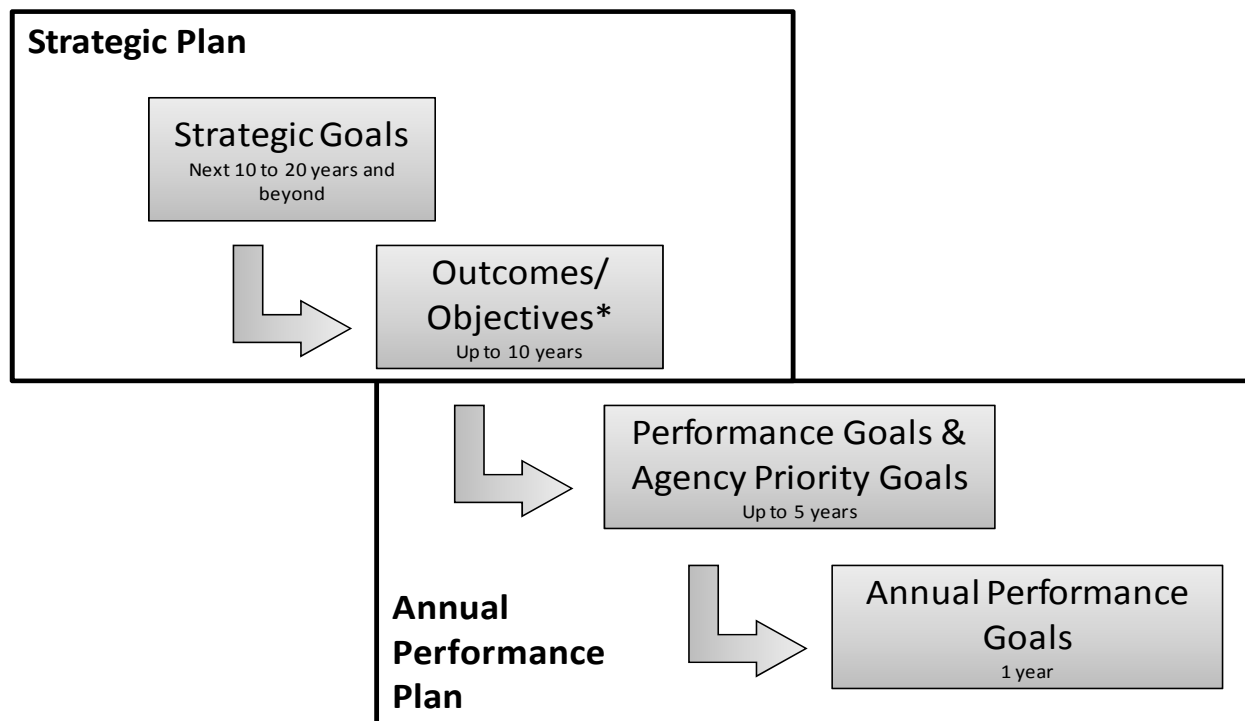
#### PERFORMANCE FRAMEWORK

This section provides a comprehensive record of the past and planned performance for NASA's programs and projects. It discusses:

- NASA's performance framework, budget by strategic goal, performance management approach, and verification and validation of performance information;
- Performance improvement initiatives;
- 2012 Major Program Annual Report (MPAR); and
- FY 2012 and FY 2013 Performance Plans, including Agency Priority Goals and performance trends.

NASA's [2011 Strategic Plan](#) sets the direction and establishes the framework for the Agency's performance. The performance framework consists of five levels of performance measures as seen in Figure 1. The strategic goals form the top of the framework, with four levels supporting the achievement of outcomes, objectives, performance goals, Agency Priority Goals, and annual performance goals. Each level in the framework is associated with a specific timeframe. The tactical plans of individual offices within NASA flow from the framework. The plans are generally internal to the Agency and guide each component to achieving performance goals and annual performance goals.

**Figure 1. Performance Framework**



**Note:** Objectives are not explicitly called out in the performance plan, consistent with information reflected in [performance.gov](#) and the FY 2011 PAR.

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The Strategic Plan sets the top three levels in the performance framework—strategic goals, outcomes, and objectives—which reflect NASA’s long-term plans for the next 10 to 20 years and beyond. The Strategic Plan represents the overall direction of the Agency and is the result of rigorous internal planning and external consultation with the Agency’s stakeholders. Each strategic goal may be supported by multiple NASA organizations, and requires internal stakeholder commitments and support to ensure success.

While the Strategic Plan focuses on long-term activities, NASA’s performance goals, Agency Priority Goals, and annual performance goals, set quantifiable targets for NASA’s programs, projects, and offices. Performance goals and Agency Priority Goals focus on planned progress over the next 18 months to five years. Annual performance goals align to NASA’s themes and programs in the Congressional Justification (CJ). These measures are published in annual performance plans, which also identify each responsible program or office. The FY 2012 and FY 2013 Performance Plans are included in this section. NASA identifies the operational processes, training, skills and technology, as well as the human capital, information technology, resources, and strategies required to meet the performance goals listed in the program and project pages of the CJ.

Certain NASA offices and mission directorates develop tactical plans to guide them in meeting performance commitments made to the public. They flow from the performance framework, and NASA makes these plans publicly available as often as possible. For example, in FY 2012, the Office of Human Capital Management will update the Agency’s plan for human capital programs, initiatives, and projects that will advance agency performance goals. The corresponding annual performance goals for this office are published in the FY 2012 and FY 2013 Performance Plans. Additional information on NASA’s human capital efforts is available at <http://nasapeople.nasa.gov/>. In addition, the NASA Office of Education developed NASA’s *Fiscal Years 2011 and 2012 Annual Plan to Assist Historically Black Colleges and Universities (HBCU)*. The plan facilitates research and development activities at HBCUs that contribute substantially to NASA’s Mission, prepares faculty and students at HBCUs to successfully participate in the competitive research and educational processes of NASA’s mission directorates, engages underrepresented minority students, educators, and researchers in NASA’s education program, and partners with HBCUs to increase the number of students who successfully complete the curriculum requirements for undergraduate degrees in NASA-related fields.

NASA’s performance framework also provides a means to communicate with stakeholders and the public. Through this framework, NASA holds itself accountable for the Nation’s investment in its programs and missions, reporting on achievements as well as shortfalls, and informing the performance plan for the next year. NASA reports progress in its performance plan to Congress and the public in the Agency’s annual [Performance and Accountability Report \(PAR\)](#), which supports programmatic decision-making at a government-wide level. NASA leverages this reporting process to monitor progress against the performance plan on a quarterly basis. This feedback allows NASA leaders to make course corrections through the year and to maintain alignment with strategic goals.

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### **BUDGET BY STRATEGIC GOAL**

NASA's activities are guided by six strategic goals:

- Strategic Goal 1: Extend and sustain human activities across the solar system.
- Strategic Goal 2: Expand scientific understanding of the Earth and the universe in which we live.
- Strategic Goal 3: Create the innovative new space technologies for our exploration, science, and economic future.
- Strategic Goal 4: Advance aeronautics research for societal benefit.
- Strategic Goal 5: Enable program and institutional capabilities to conduct NASA's aeronautic and space activities.
- Strategic Goal 6: Share NASA with the public, educators, and students to provide opportunities to participate in our Mission, foster innovation, and contribute to a strong national economy.

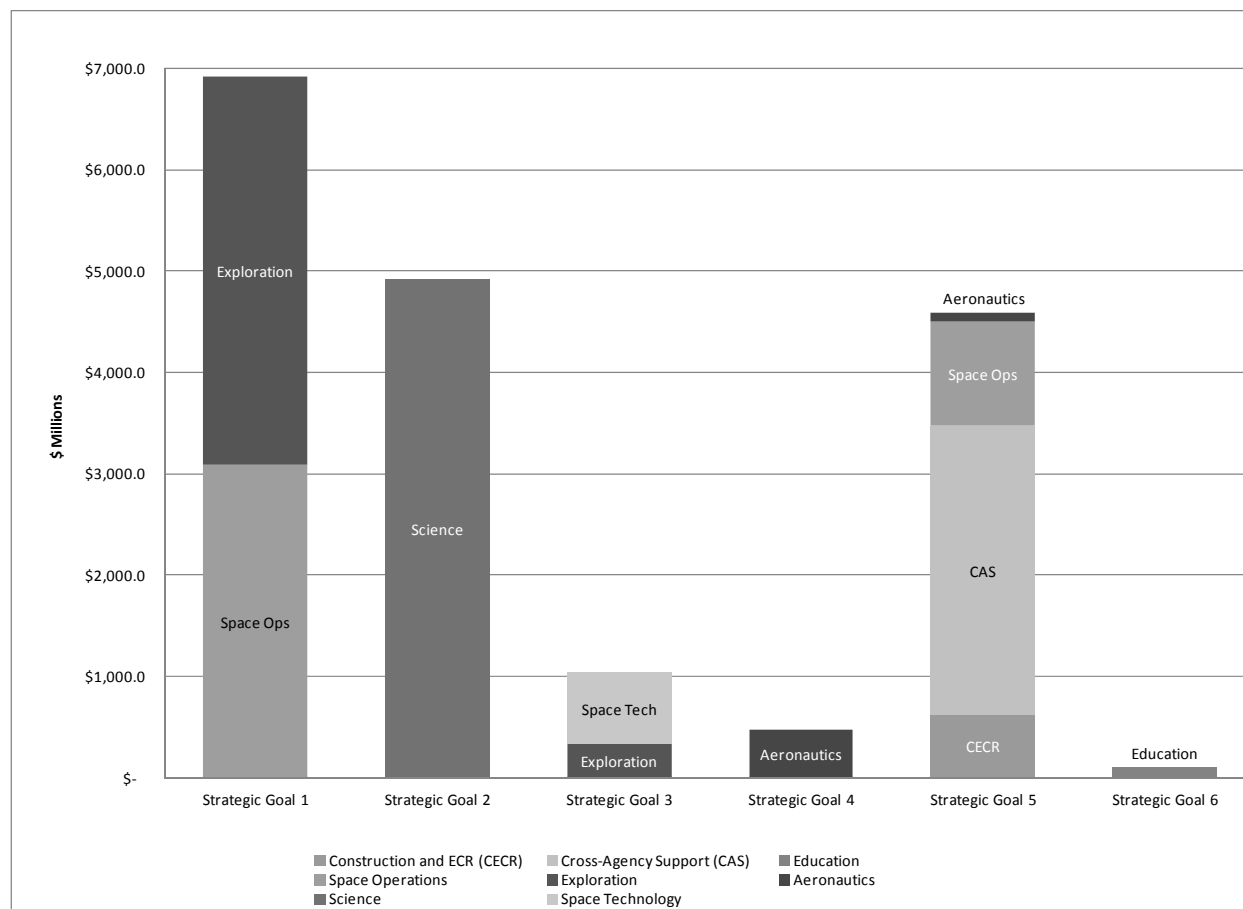
To reflect the budget for each strategic goal, NASA maps its annual approved budget authority to its strategic goals. This process involves mapping mission directorate, mission support, and Education accounts, and their supporting programs, to their respective strategic goals. This performance-to-budget alignment is indicated in the Agency's annual performance plan that links each annual performance goal, and responsible program, to the strategic goals.

Figure 2 illustrates how NASA's FY 2013 budget request aligns to its strategic goals.

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**Figure 2. FY 2013 Budget by Strategic Goal**



## PERFORMANCE MANAGEMENT

NASA governs performance through four Agency-level councils with distinct charters and responsibilities. Specific details on the roles of the councils can be found in [NASA's Governance and Strategic Management Handbook](#). In FY 2011, NASA redesigned the governance council structure, creating a focused Executive Council, to address strategic and policy issues. The Strategic Management Council, which includes representatives from all parts of NASA, now makes recommendations on various issues to the Executive Council. Moreover, the Mission Support Council was modified to streamline processes that address Mission enabling issues; no changes were made to the Program Management Council. NASA will update the *Governance and Strategic Management Handbook* in 2012. The update will include current roles and processes, while maintaining the governance principles and strategic management system.

NASA develops, implements, and continuously measures the Agency's progress in pursuit of its strategic goals, outcomes, and performance measures through its strategic management system. This system includes planning and performance management processes that are essential for transparency and

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accountability. NASA's integrated system provides data and information to decision makers through assessments of performance in relation to annual plans. The cycle requires programs to plan, develop and implement strategy; monitor, assess, and evaluate performance toward commitments; identify issues; and gauge programmatic and organizational progress.

The performance data from NASA's strategic management system provides a foundation for both programmatic and institutional decision-making processes and key investment decisions. Specific program and project pages provide additional details on how specific goals will be achieved. NASA's planning and performance management processes provide this data to senior leadership through various formats, including:

- Ongoing monthly and quarterly analysis and reviews of Agency activities;
- Annual assessments in support of budget formulation (for budget guidance and issue identification, analysis, and disposition);
- Annual reporting of performance, management issues, and financial position;
- Periodic, in-depth program or special purpose assessments; and
- Recurring or special assessment reports to internal and external organizations.

NASA's performance management system aligns internal management needs with the guidance and requirements of external stakeholders, including the Government Performance and Results Act (GPRA) Modernization Act and Executive Order 13450, "Improving Government Program Performance." Examples of recent performance improvement activities are provided in Performance Improvement.

In addition, NASA continues to find value in and improve upon its monthly forum, the Baseline Performance Review (BPR). As an integrated review of institutional and program activities, interrelated issues that impact performance and program risk are highlighted and actions are assigned for resolution. The BPR forum fosters communication across organizational boundaries to address mutual concerns and interests.

### **ACCURACY AND RELIABILITY OF NASA'S PERFORMANCE DATA**

In accordance with the GPRA Modernization Act, NASA ensures that performance data is accurate, complete, consistent, and current. Building on efforts in previous years, NASA also continues to promote robust verification and validation processes for all its performance measures to support the Agency's internal decision-making and external reporting requirements.

Data management provides the backbone for NASA's performance management processes. The mission directorates and mission support offices collect data to assess performance and assign ratings to its performance goals and annual performance goals. Given the varying types of performance measures across mission directorates, sources of data, collection methods and record keeping, NASA has established a verification and validation methodology to meet each mission directorate's needs.

Each quarter, program officials submit to NASA management the supporting performance information that justifies each rating, and NASA managers review this data in periodic meetings. NASA also conducts additional reviews and evaluations of reported performance data to assess whether the information submitted is consistent with information reported at other internal reviews or assessments by external

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independent entities, and is complete enough to portray an accurate picture of NASA's performance. The quarterly reporting process contributes to the development of the Congressional Justification and performance plans by highlighting progress to date, cross-cutting coordination efforts, and effectively addressing areas of concerns, including but not limited to data quality limitations. The quarterly performance reporting and supporting verification processes culminate in the PAR.

### **LOW PRIORITY PROGRAM ACTIVITIES**

The 2013 Cuts, Consolidations, and Savings (CCS) volume of the President's Budget identifies the lower-priority program activities under the GPRA Modernization Act, 31 U.S.C. 1115(b)(10). The public can access the volume at: <http://www.whitehouse.gov/omb/budget>.

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# **PERFORMANCE IMPROVEMENT**

### **DESCRIPTION OF PERFORMANCE IMPROVEMENT**

Performance improvement is a critical element of NASA's performance management. NASA engages in a continuous performance improvement process in which it monitors performance against goals and baselines to identify areas for improvement, leverages results from external assessments, including those of NASA's Office of Inspector General (OIG), the Government Accountability Office (GAO), and independent evaluations, and then undertakes specific actions to improve areas identified by the performance reporting. This section highlights some of the methods, both internal and external, that NASA has recently employed to assess performance improvement opportunities, and the resulting actions NASA has conducted in order to better achieve its performance goals.

Internally, NASA engages in a number of activities to identify performance improvement opportunities, with a continuing focus in FY 2013 on improving the measures and analysis processes for monitoring and reporting on program performance. In FY 2011, NASA began performing quarterly performance assessments of progress made toward measures listed in the Agency's FY 2011 Performance Plan. The quarterly assessments culminated in the [FY 2011 PAR](#), which NASA published on November 15, 2011. The FY 2011 PAR provides a comprehensive view of NASA's performance challenges as identified by external assessments, as well as challenges monitored through Agency-managed performance reviews. The Performance Improvement Plan section of PAR details how the Agency is addressing such challenges. In addition to PAR, NASA conducts a number of other internal activities to gauge and improve performance. The Major Program Annual Report that follows is another reporting tool used to determine how well NASA manages and plans the life cycle cost and schedule of missions.

In FY 2011, NASA completed the first phase of another internal initiative with the aim of identifying improvement opportunities, which resulted in ongoing actions to improve performance. The Explanation of Change study, which has the goal of understanding the primary reasons for changes in cost and schedule estimates, first examined typical flight projects. A second phase of the study is underway to investigate flagship missions. The study resulted in 10 recommendations made to NASA leadership, based on analysis of documentation and interviews with key project personnel. Some of the recommendations have already been implemented such as Joint Confidence Level estimating, or are being incorporated in the latest revision of NASA Procedural Requirements (NPR) 7120.5: NASA Space Flight Program and Project Management Requirements. NPR 7120.5 version E is under policy review for final distribution expected July 2012. Others still being implemented include the incorporation of cost and schedule threats into a project's formulation plans, and requiring more senior project representation on-site during the integration and test phase of the project.

NASA also continues to engage in an Administration pilot program for impact evaluations, and in NASA's case, evaluates changes in decision-making performance by partner organizations due to the availability of NASA products, primarily through a value-of-information or cost-benefit approach. NASA selected the Applied Sciences Program as its pilot, which completed impact analyses of two projects during FY 2011, initiated another three analyses in FY 2011, and will start at least one more in FY 2012. Information about the analyses will be posted to the Applied Sciences Program website when available. Also in FY 2012, NASA will publish a primer for the Earth science community on socioeconomic benefits and impacts assessments. In solicitations for decision support projects, the Applied Sciences Program will include language requiring impact analyses, including the budget and schedule to conduct them, as part of the projects.

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In addition to internal monitoring, NASA uses external assessments to identify areas for potential improvement. In November 2011, NASA's OIG identified five areas that pose the top management and performance challenges to NASA leadership: the future of U.S. space flight, project management, infrastructure and facilities management, acquisition and contracting management, and information technology security and governance. More information on OIG's assessment can be found in the Management Challenges letter from NASA's OIG located in the FY 2011 PAR. GAO previously identified high risk factors along the same vein, including managing information technology, antiquated financial management systems, poor cost estimating, underestimated risks associated with development of major systems, and inadequate acquisition management in view of persistent cost growth and schedule slippage in the majority of projects. More details on GAO assessments are available on the [GAO Web site](#).

Once NASA has identified opportunities for performance improvement, it then makes changes in strategy, budget, and resource management aimed at meeting its improvement goals. One method NASA uses to initiate change involves performance improvement planning. When a NASA program does not meet its commitment as stated in the annual performance plan, responsible program officials must explain performance shortfalls and provide an improvement plan to address the issues impacting performance. In FY 2011, in an effort to set better performance improvement plans, NASA assessed the explanations of performance shortfalls and looked for trends in root causes to inform senior management on any cross-cutting corrective actions that may be warranted. The FY 2011 PAR details these shortfalls, resulting improvement plans, and responsible organizations.

NASA's acquisition management practices present another opportunity for far-reaching improvement. NASA is currently pursuing Agency-wide actions to improve program and project management, including life cycle cost estimating, and acquisition practices to address challenges in life cycle cost and schedule management. NASA used information gathered on management and performance challenges, including the High Risk List identified by NASA's OIG and the GAO, to help guide these actions, and then implemented a number of initiatives over the past seven years to reform and to improve NASA's acquisition practices including:

- In 2008, the Agency developed the NASA Policy Directive (NPD) 1000.5A to provide a framework for linking budgeting to decisions on life cycle cost and schedule baselines.
- In 2005, NASA implemented and began refining a new cost analysis and estimation processes, the Cost Analysis Data Requirement (CADRe) and Joint Confidence Level estimation. NASA expects the application of the JCL process to increase the insight of project and program managers and others into uncertainties and contingencies within an integrated cost and schedule plan.
- NASA improved its earned value management capabilities, starting with the codification in Agency policy in 1998. This technique has evolved over the past decade, and currently focuses on measuring the performance of the civil servant staff for a more holistic picture of a NASA project, which often consists of both externally procured and in-house design and development.
- NASA recently established and piloted of leading technical indicators at the Preliminary Design Review (PDR), the review just prior to committing to a cost and schedule baseline, to assess a project's maturity.

NASA will continue ongoing assessments of its performance to discover opportunities for improvement. The regularity of these assessments keeps decision makers informed on the latest challenges with programs, projects, and the Agency, allowing them to improve strategy, budget, and resource

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management choices. Through this ongoing process, NASA continues to strive to meet or exceed its performance goals.

## **2012 MAJOR PROGRAM ANNUAL REPORT (MPAR) SUMMARY**

### **2012 MPAR SUMMARY**

The 2012 MPAR is provided to meet the requirements of section 103 of the NASA Authorization Act of 2005 (P.L. 109-155; 42 U.S.C. 16613). The 2012 MPAR consists of this summary and FY 2013 Budget Estimate pages of MPAR Projects in Development. These project pages constitute each project's Annual Report, or, if this is the first year for which it is in reporting, baseline report. The MPAR summary also includes the confidence level of achieving the commitments as requested in the Conference Report accompanying the FY 2010 Consolidated Appropriations Act (P.L. 111-117).

### **CONFIDENCE LEVELS**

NASA uses a confidence level approach to budgeting. This approach incorporates program and project risks into cost and budget estimates and, as such, is suited to NASA's complex, high-risk portfolio. This approach affords project managers the necessary flexibility to manage and mitigate technical and other risks associated with NASA's missions. The likelihood of meeting any given estimate is referred to as the confidence level (CL).

Implementation of the confidence level approach varies depending on the type of program. Regarding confidence levels, NASA distinguishes between Space Flight and Ground System projects in development, projects in operations, and Research and Technology projects. All projects currently subject to MPAR reporting fall within the Space Flight category. NASA's acquisition strategy policy (NPD 1000.5A) requires spaceflight programs and projects to develop probabilistic cost estimates for spaceflight projects in development, which incorporate the likely cost impacts of project risks. NASA targets a confidence level of at least 70 percent for most of its programs and projects. NASA has included the confidence level in Table 1, where applicable.

NASA evolved its probabilistic cost estimation from "cost risk only" to a joint cost and schedule approach designed to increase the likelihood of project success at the specified funding level. The application of the joint cost and schedule confidence level (JCL) approach will increase insight into risks and associated contingencies within a project's integrated technical, cost, schedule, and phasing plan.

NASA started developing estimates using the JCL approach during 2010. Many projects entering development before 2010 had baselines established under cost estimating policies that preceded JCL. Only two of the current MPAR projects were baselined before 2010.

Research and technology development programs address technical and science challenges and outcomes. These programs do not include reserves or specific confidence levels within their estimated costs. Rather, the programs operate on a "level of effort" basis, matching progress to available funding and using interim milestones to assess on-going progress towards key research or technology goals.

### **CHANGES IN MPAR COMPOSITION SINCE THE 2012 NASA BUDGET ESTIMATES**

No new projects with estimated life cycle costs greater than \$250 million received authority to proceed into development since the 2011 MPAR was prepared for the 2012 NASA Budget Estimates.

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# **2012 MAJOR PROGRAM ANNUAL REPORT (MPAR) SUMMARY**

The 2011 MPAR in the 2012 NASA Budget Estimates included six projects that are no longer in MPAR reporting. Those projects are: Aquarius, Glory, GRAIL, Juno, MSL, and NPP. Aquarius, GRAIL, Juno, MSL, and NPP all launched successfully in FY 2011 and early FY 2012. The Glory mission launched in FY 2011 but was lost when the payload fairing from the Taurus XL launch vehicle failed to separate from the rocket.

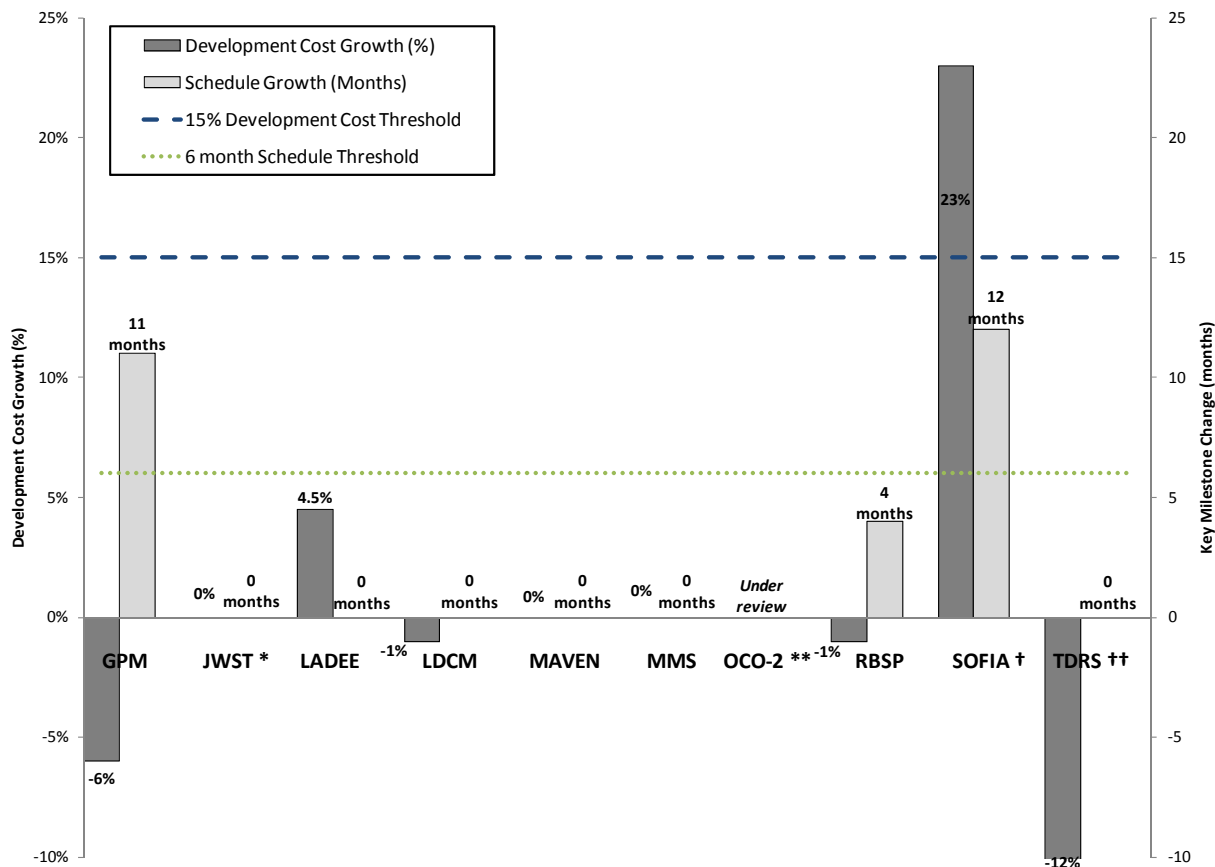
Updated cost and schedule estimates are provided in Table 1 for ten projects baselined in previous MPAR reports:

- Global Precipitation Measurement (GPM);
- James Webb Space Telescope (JWST);
- Lunar Atmosphere and Dust Environment Explorer (LADEE);
- Landsat Data Continuity Mission (LDCM);
- Mars Atmosphere and Volatile Evolution (MAVEN);
- Magnetospheric MultiScale mission (MMS);
- Orbiting Carbon Observatory 2 (OCO-2);
- Radiation Belt Storm Probes (RBSP);
- Stratospheric Observatory for Infrared Astronomy (SOFIA); and
- Tracking and Data Relay Satellite (TDRS) K and L.

Figure 3 provides a summary of cost and schedule changes against established baselines for the 10 MPAR projects.

## 2012 MAJOR PROGRAM ANNUAL REPORT (MPAR) SUMMARY

**Figure 3. Summary of Cost and Schedule Changes for MPAR Projects**



\* The JWST rebaseline is officially established in the FY 2013 Congressional Justification. The original baseline Development cost was \$2,581.1 million and the original LRD was June 2014.

\*\* The cost and schedule for OCO-2 are currently under review due to uncertainty regarding the launch vehicle for the mission.

† In 2010, addressing concerns with SOFIA program performance, NASA approved a revised plan establishing new intermediate milestones that lead to Full Operational Capability (FOC) in December 2014. The plan established high confidence in the new cost estimates and activity schedules that will achieve the FOC milestone and enabled the recent successful completion of the initial science flights. There are no changes to SOFIA from last year.

†† TDRS reflects TDRS K/L only.

NASA has rebaselined JWST and has made significant changes in the project's management in 2011, in response to cost and schedule performance issues and the recommendations of the [Independent Comprehensive Review Panel \(ICRP\) report](#). As a result of the rebaseline, the launch date moved from 2014 to 2018, and the development cost increased from \$2.581 billion to \$6.198 billion.

## **2012 MAJOR PROGRAM ANNUAL REPORT (MPAR) SUMMARY**

### **CHANGES IN COST AND SCHEDULE ESTIMATES FROM THE 2011 MPAR**

Three projects exceeded a cost or schedule threshold since the 2011 MPAR:

- JWST cost and schedule estimates have grown since the baseline in 2009. The FY 2013 Congressional Justification officially establishes a new baseline for JWST consistent with direction in NASA's FY 2012 Appropriation to cap JWST formulation and development costs at \$8.0 billion.
- The GPM project launch date slipped to June 2014 for several reasons. The Japanese Aerospace Exploration Agency (JAXA) is contributing an instrument for the mission, and after the March 2011 earthquake in Japan, JAXA experienced component and delivery issues with the Dual-frequency Precipitation Radar (DPR) instrument. There were also delays in the spacecraft and GPM Microwave Imager (GMI) instrument development. Due to this schedule threshold breach, NASA is completing reporting required by Section 103 (d) of the NASA Authorization Act of 2005, which will provide additional information on the GPM mission, including reasons for changes in schedule, alternatives assessed by the Agency, and the selected actions.
- The OCO-2 satellite was planned to launch on a Taurus XL, which following the failure in March 2011 for the Glory mission, was put on hold pending the outcome of a failure investigation. As a result, the planned launch readiness date will change. The project's cost and schedule are currently under review.

### **MPAR SUMMARY TABLE**

Table 1 provides cost, schedule, and confidence level information for NASA projects currently in development with life cycle cost estimates of \$250 million or more.

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# 2012 MAJOR PROGRAM ANNUAL REPORT (MPAR) SUMMARY

**Table 1. MPAR Summary Table**

Project	Base Year	JCL (%) <sup>1</sup>	Development Cost Est. (\$M)		Cost Change (%)	Key Mile- stone <sup>2</sup>	Key Milestone		Schedule Change (months)	Cost Change > 15% <sup>3</sup>	Schedule Change > 6 Mo <sup>3</sup>	Factors Contributing to Breaches since 2011 MPAR	
			Base	2012			Base	2012				Internal	External
GPM	2010	70 <sup>4</sup>	555.2	519.3	-6.5	LRD	Jul-13	Jun-14	11		X	Spacecraft/ Instrument delays	March 2011 earthquake in Japan
JWST <sup>5</sup>	2012	66	6,197.9	6,197.9	0	LRD	Oct-18	Oct-18	0				
LADEE	2011	70	168.2	175.8	4.5	LRD	Nov-13	Nov-13	0				
LDCM <sup>6</sup>	2010	70	583.4	577.2	-1.1	LRD	Jun-13	Jun-13	0				
MAVEN	2011	70 <sup>7</sup>	567.2	567.2	0	LRD	Nov-13	Nov-13	0				
MMS <sup>8</sup>	2010	70	857.3	857.3	0	LRD	Mar-15	Mar-15	0				
OCO-2 <sup>9</sup>	2011	70 <sup>10</sup>	249	U/R	U/R	LRD	Feb-13	U/R	U/R				
RBSP	2009	70 (CL)	533.9	530.9	-0.6	LRD	May-12	Sep-12	4		X		Taurus XL LV
SOFIA	2007	70	919.5	1,128.4	22.6	FOC	Dec-13	Dec-14	12	†	†		
TDRS- K/L <sup>11</sup>	2010	75 (CL)	209.4	183.6	-12.3	LRD	K: Dec-12 L: Dec-13	K: Dec-12 L: Dec-13	0				

<sup>1</sup> The confidence level (CL) estimates reported here reflect an evolving process as NASA improves its probabilistic estimation techniques and processes. Each estimate reflects the practices and policies at the time it was developed. Estimates that include combined cost and schedule risks are denoted as Joint Confidence Level (JCL) estimates; all other CLs reflect cost confidence without necessarily factoring the potential impacts of schedule changes on cost.

<sup>2</sup> Key Milestone definitions: LRD = Launch Readiness Date; FOC = Full Operational Capability

<sup>3</sup> An "X" indicates new changes compared to the 2011 MPAR. A "†" represents a change that occurred prior to the 2011 MPAR.

<sup>4</sup> For GPM, the JCL reflects the KDP-C Replan JCL, approved in October 2011.

<sup>5</sup> The JWST rebaseline is officially established in the FY 2013 Congressional Justification. The original baseline development cost was \$2,581.1 million and the original LRD was June 2014. Construction of Facilities funds are included in the project's MPAR Cost Estimate.

<sup>6</sup> For LDCM, the confidence level estimate addresses the full partnership; the development cost reflects the NASA portion of project costs.

<sup>7</sup> For MAVEN, the JCL included schedule risk of the launch vehicle but used the Headquarters-provided launch vehicle cost as a pass-through number per agreement with the Standing Review Board (SRB).

<sup>8</sup> For MMS, the confidence level estimate addresses the full partnership; the development cost reflects the NASA portion of project costs.

<sup>9</sup> The cost and schedule for OCO-2 are currently under review (U/R) due to uncertainty regarding the launch vehicle for the mission.

<sup>10</sup> For OCO-2, the JCL was performed for Phases C and D, excluding project managed unallocated future expenses, JPL fees, launch services, and low-level fixed cost activities at GSFC.

<sup>11</sup> For TDRS, the confidence level (done for TDRS K/L) estimate addresses the full partnership; the development cost reflects the NASA portion of project costs. While current baseline costs are solely for TDRS K/L, TDRS M will be added to the project's scope in FY 2012 pursuant to direction in the FY 2012 Consolidated and Further Continuing Appropriations Act (P.L. 112-55); accordingly, NASA will revise the TDRS baseline cost estimate in the coming months.

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**2012 MAJOR PROGRAM ANNUAL REPORT (MPAR) SUMMARY**

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# **AGENCY PRIORITY GOALS**

### **AGENCY PRIORITY GOALS**

Per the GPRA Modernization Act, 31 U.S.C. 1115(b)(10), requirement to address Federal Goals in the agency Strategic Plan and Annual Performance Plan, please refer to Performance.gov for information on Federal Priority Goals. NASA supports the Federal Priority Goals through various activities, including those focused on education. NASA's education portfolio is aligned with the priorities identified in the Committee on STEM's Five-Year Strategic Plan. The Education Performance Goals under NASA Strategic Goals 5 and 6 are supportive of the Administration's priorities and represent NASA's contribution toward achievement of Federal efforts, including related Cross Agency Priority Goal(s).

In FY 2010, NASA began tracking its two-year Agency Priority Goals, formerly called High Priority Performance Goals, which were developed in response to the GPRA Modernization Act and a White House initiative for building a high-performing government. While the Agency Priority Goals do not provide a complete representation of all high profile activities within NASA, they do represent important near-term priorities. Further details are available in the Agency Overview. For FY 2012 to FY 2013, NASA identified four new Agency Priority Goals which represent challenging, near-term targets that the Agency will reach to benefit the American people in the areas of space operations, human spaceflight, planetary science, and space technology. Though these goals represent activities already planned by NASA in that timeframe, NASA will be tracking more detailed action plans and quarterly milestones for these selected goals. This section lists the goals. More information can be found at <http://www.performance.gov>. NASA will publish an addendum to its Strategic Plan to reflect these new Agency Priority Goals.

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### AGENCY PRIORITY GOALS

<b>Agency Priority Goal Statement:</b>	
<b>Impact Statement:</b> Sustain operations and full utilization of the International Space Station (ISS). <b>Key Indicator:</b> By the end of FY 2013, NASA will complete at least three flights delivering research and logistics hardware to the ISS by U.S.-developed cargo delivery systems.	
<b>Description:</b> The ISS is a major stepping stone in achieving NASA's exploration goals across the solar system. It provides a space-based research and development laboratory to safely perform multidisciplinary, cutting-edge research. The continuously crewed laboratory—the Nation's newest National Laboratory—enables the ongoing evolution of research and technology objectives and ensures that the benefits of this multinational investment can be realized.  In order to provide cargo transportation to and from ISS—for the Agency and for users of the Station in its capacity as a National Laboratory—NASA will depend on U.S. industry to provide commercial resupply services following the retirement of the Space Shuttle. These commercial services are planned to help support U.S. operations and utilization of the ISS to meet NASA mission objectives, NASA obligations for international utilization cargo under the ISS Memoranda of Understanding (MOUs), and the needs of other civil and commercial users of the Space Station.	
<b>Goal Leader:</b> Mark Uhran, Director, International Space Station Division	<b>Contributing Programs:</b> International Space Station, ISS Crew and Cargo Transportation, Federal Aviation Administration (FAA)
Supports Strategic Goal 1: Extend and sustain human activities across the solar system.	
Supports Outcome 1.1: Sustain the operation and full use of the International Space Station (ISS) and expand efforts to utilize the ISS as a National Laboratory for scientific, technological, diplomatic, and educational purposes and for supporting future objectives in human space exploration.	

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# AGENCY PRIORITY GOALS

<b>Agency Priority Goal Statement:</b>	
<p><b>Impact Statement:</b> Develop the Nation's next generation Human Space Flight (HSF) system to allow for travel beyond low Earth orbit (LEO).</p> <p><b>Key Indicator:</b> By September 30, 2013, NASA will finalize cross-program requirements and system definition to ensure that the first test flight of the Space Launch System (SLS) and Multi-Purpose Crew Vehicle (MPCV) programs is successfully achieved at the end of 2017 in an efficient and cost effective way.</p>	
<p><b>Description:</b> NASA's Human Exploration Operations Mission Directorate (HEOMD) has been charged with developing the nation's next generation Human Space Flight (HSF) system as mandated in the NASA Authorization Act of 2010 (P.L. 111-267). The next generation of HSF vehicles, which include the Orion Multi-purpose Crew Vehicle (MPCV) and the Space Launch System (SLS), are making significant progress on once again returning Americans to beyond low Earth orbit (LEO). The Exploration Ground Systems (EGS) program provides support for these vehicles as well as other users of launch systems at the Kennedy Space Center (KSC).</p> <p>NASA's plan calls for the initial destination for human spaceflight beyond LEO to target an asteroid by the middle of the next decade. Other destinations could include cis-lunar space (the region between the Earth's atmosphere and the Moon) such as the Earth-Moon Lagrange points, the lunar surface, and eventually Mars and its moons. All of these destinations are scientifically compelling and rich in data that will provide continuous expansion of human knowledge of the universe and inspire humankind.</p>	
<p><b>Goal Leader:</b> William Hill, Assistant Deputy Associate Administrator, Exploration Systems Division</p>	<p><b>Contributing Programs:</b> Space Launch Services, Orion Multi-Purpose Crew Vehicle, Exploration Ground Systems, Office of the Chief Technologist, Human Exploration and Operations Mission Directorate Advanced Exploration Systems division, Department of Defense (DoD), other government agencies, domestic, commercial, and international partners</p>
<p>Supports Strategic Goal 1: Extend and sustain human activities across the solar system.</p>	
<p>Supports Outcome 1.3: Develop an integrated architecture and capabilities for safe crewed and cargo missions beyond low Earth orbit.</p>	

## MANAGEMENT AND PERFORMANCE

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#### Agency Priority Goal Statement:

**Impact Statement:** Use the Mars Science Laboratory Curiosity Rover to explore and quantitatively assess a local region on the surface of Mars as a potential habitat for life, past or present.

**Key Indicator:** By September 30, 2013, NASA will assess the biological potential of at least one target environment on Mars by obtaining chemical and/or mineralogical analysis of multiple samples of its surface.

**Description:** The Mars Science Laboratory (MSL) launched on November 26, 2011, with the overall science objective of exploring and quantitatively assessing a local region on the surface of Mars as a potential habitat for life, past or present. This mission will use ten science instruments carried on a rover platform that will operate under its own power and telemetry and is expected to remain active for one Mars year (687 days). Mars, one of four terrestrial planets, provides the opportunity to answer many of the key questions concerning solar system history, planetary evolution, and the potential for life. Mars provides the opportunity to possibly answer origin and evolution of life questions, with its clear potential for past and possibly present biological activity. Furthermore, the Red Planet has a record of its climate and geologic evolution exposed over much of the surface—an incomparable treasure trove of ancient planetary processes, including those possibly leading to the origin of life. On Earth, rocks preserved from the first billion years are extremely rare and have been altered by weather and geologic processes.

As the first roving analytical laboratory sent to another planet and the first astrobiology mission since Viking, the Curiosity rover will assess the biological potential of the site by investigating discovered organic and inorganic compounds and the processes that might preserve them. Also, the rover will characterize the site's geology and geochemistry, including chemical, mineralogical, and isotopic composition. With the combination of remote sensing and analytical instrumentation, the rover team will be able to investigate the role of water, atmospheric evolution, and modern weather/climate. Curiosity will be able to characterize the spectrum of surface radiation, important to understanding the surface chemistry and the environment for future human exploration of Mars. Because of the tremendous analytical capabilities of Curiosity, what is discovered in the region of the landing site will provide ground truth for our orbital observations and enhance our understanding of mineral distributions planet-wide.

**Goal Leader:** Doug McCuiston,  
Director, Mars Exploration Program

**Contributing Programs:** Science Mission Directorate (SMD), Human Exploration and Operations Mission Directorate (HEOMD), Ames Research Center, Goddard Space Flight Center, Jet Propulsion Laboratory, Kennedy Space Flight Center, United Launch Alliance, U.S. Department of Energy, Los Alamos National Laboratory, the Southwest Research Institute, Canadian, Russian, Spanish, French and German space agencies

Supports Strategic Goal 2:

Expand scientific understanding of the Earth and the universe in which we live.

Supports Outcome 2.3:

Ascertain the content, origin, and evolution of the solar system and the potential for life elsewhere.

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### Agency Priority Goal Statement:

**Impact Statement:** Enable bold new missions and make new technologies available to Government agencies and U.S. industry.

**Key Indicator:** By September 30, 2013, document the maturation of new technologies by completing 4,065 technology-related products, including patents, licenses, and mission use agreements.

**Description:** Our Nation's competitiveness is due in large part to decades of investment in technology and innovation. These investments allow NASA to achieve the increasingly challenging and complex science, exploration, and aeronautics mission goals that will enable new missions never before possible. Through collaboration and partnership which has been a vital component of NASA's mission, we are building tomorrow's technologies today. Our efforts are advancing the technological capabilities and systems available to government agencies and U.S. industry. This investment creates high-tech jobs in the United States and will strengthen the U.S. global leadership in technology and innovation.

NASA strives to make the latest technologies available to industry and other government agencies as soon as they are developed. This transfer of technology provides countless opportunities for private industry to develop new innovative commercial products and services ensuring the greatest benefit from the Nation's investment in Space Technology.

NASA's plan implements a robust effort that matures technologies so that they are used by NASA missions as well as other government agencies and the private sector. NASA identifies and patents those technologies that are promising while industry licenses existing patents. Some technologies also are distributed via other collaborative research partnerships. Through this Agency Priority Goal, NASA will illustrate its success in developing and transferring innovations from the inventors to the users while contributing to U.S. economic growth.

**Goal Leader:** Mason Peck, Chief Technologist

**Contributing Programs:** Human Exploration Operations Mission Directorate (HEOMD), Science Mission Directorate (SMD), Aeronautics Research Mission Directorate (ARMD), Office of the Chief Engineer (OCE), Office of the Chief Health and Medical Officer (OCHMO), Office of Safety and Mission Assurance (OSMA), Office of General Counsel (OGC), NASA Centers, additional partnerships with other government agencies, industry, and international entities

Supports Strategic Goal 3:

Create the innovative new space technologies for our exploration, science, and economic future.

Supports Outcome 3.4:

Facilitate the transfer of NASA technology and engage in partnerships with other government agencies, industry, and international entities to generate U.S. commercial activity and other public benefits.

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# **INTRODUCTION TO THE FY 2012 PERFORMANCE PLAN UPDATE**

## **INTRODUCTION TO THE FY 2012 PERFORMANCE PLAN UPDATE**

Each fiscal year, NASA's budget request to Congress contains an annual performance plan that aligns with the funds requested. NASA typically needs to update some measures in the plan at the beginning of the year of execution. When the final appropriation differs from the amount requested, or if Congressional or Executive direction places a different emphasis on programs relative to what was initially requested, an update to the annual performance plan may be required. Additionally, the dynamic nature of research and development can lead to shifting priorities, and the activities that were originally identified in the annual performance plan may no longer be pursued by NASA.

NASA submitted the FY 2012 Performance Plan with its FY 2012 Congressional Justification in February 2011. Since then, several factors – in addition to typographical or other inaccuracies and changes to NASA's budget structure – have made it necessary to update the plan. First, NASA's execution of its FY 2011 performance plan was impacted by the year-long continuing resolution, and some activities were not initiated. As a result, one measure (APG 3.4.1.5: ST-11-7) was delayed from FY 2011 and carried over to FY 2012 (3.4.1.5: ST-12-17), which involves completion of the original activity and additional related activities. In other cases, work has already been completed, and the measures have been updated accordingly. In addition, NASA received Congressional or Executive direction through the FY 2012 Appropriation in November 2011, as well as other issued directives and guidance; as a result, NASA updated or combined measures.

This section provides a summary of NASA's performance commitments for FY 2012. Measures that have been revised are identified with an asterisk (\*). Measures that have been deleted or re-written and combined with other measures are listed below:

APG 2.3.3.2: PS-12-10: Complete the Mars 16 Mission Confirmation Review. (Rationale for change: Budgetary Congressional/Executive direction.)

- Performance Goal 3.1.1.3: Establish and maintain a culture of innovation at each of the 10 NASA Centers through the development of new Center ideas and technologies. (Rationale for change: Budgetary Congressional/Executive direction.)
- APG 3.1.1.3: ST-12-3: Twenty innovative projects will be initiated across the NASA Centers. (Rationale for change: Goal reduced based on budgetary Congressional/Executive direction. Measure was combined with 3.1.1.1: ST-12-1)
- Performance Goal 3.1.1.6: Accelerate the development of push technologies to support the future space, science and exploration needs of NASA, other government agencies, and the commercial space sector. (Rationale for change: Budgetary Congressional/Executive direction. Measure was combined with 3.1.1.1: ST-12-1.)
- APG 3.1.1.6: ST-12-6: Complete 100 research plans. (Rationale for change: Goal reduced based on budgetary Congressional/ Executive direction.)
- Performance Goal 3.2.2.1: Mature technologies that enable small satellites to provide game changing capabilities for the government and commercial space sectors. (Rationale for change: Goal deleted based on budgetary Congressional/Executive direction.)
- APG 3.2.2.1: ST-12-8: Initiate development of at least two new technologies with game changing potential for small satellites. (Rationale for change: Goal deleted based on budgetary Congressional/ Executive direction.)

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- Performance Goal 3.4.1.3: Successful application of Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) technologies into commercial products or services. (Rationale for change: Goal deleted based on budgetary Congressional/ Executive direction.)
- APG 3.4.1.3: ST-12-15: Greater than 35 percent of the Phase II Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) technology projects awarded between 2007-2011 will be transferred into commercial products or services. (Rationale for change: Goal deleted based on budgetary Congressional/ Executive direction.)
- APG 5.1.1.1: AMO-12-1: Ninety percent of Shuttle workforce is assigned to follow-on work by FY 2012 year-end. (Rationale for change: APG complete. New APG covers activity area and consolidates measures.)
- APG 5.1.1.1: AMO-12-2: Twenty percent or more of annual recruitments will be through the early career hiring initiatives. (Rationale for change: New APG covers activity area and consolidates measures.)
- Performance Goal 5.1.1.2: Build skills across all levels of the workforce through Leadership Development Opportunities. (Rationale for change: Consolidated measure.)
- APG 5.1.1.2: AMO-12-3: Install an Agency-wide mentoring program that includes an automated system for matching mentors and mentees. (Rationale for change: New APG covers activity area and consolidates measures.)
- APG 5.1.1.2: AMO-12-4: Eighty percent of the Agency's leadership training and development programs include "leading through transformation" content. (Rationale for change: New APG covers activity area and consolidates measures.)
- Performance Goal 5.1.1.3: Achieve and sustain an effective labor-management dialogue. (Rationale for change: Consolidated measure.)
- APG 5.1.1.3: AMO-12-5: Identify and address at least three significant labor-management challenges identified during the year during periodic Agency-led Labor Management Forums. (Rationale for change: New APG covers activity area and consolidates measures.)
- Performance Goal 5.1.1.4: Adopt and respond to innovative employee feedback mechanisms. (Rationale for change: Consolidated measure.)
- APG 5.1.1.4: AMO-12-6: Seventy-five percent of NASA's primary installations implement improvement initiatives derived from the Federal Employee Viewpoint Survey. (Rationale for change: New APG covers activity area and consolidates measures.)
- Performance Goal 5.2.1.1: Through 2015, assure zero fatalities or permanent disabling injuries to the public. (Rationale for change: Consolidated three performance goals into one.)
- Performance Goal 5.2.1.2: By 2015, achieve a four percent reduction in the total case rate and lost time rate for the NASA civil service work force. (Rationale for change: Consolidated three performance goals into one.)
- Performance Goal 5.2.1.3: By 2015, reduce damage to NASA assets by eight percent from the 2010 baseline. (Rationale for change: Consolidated three performance goals into one.)
- Performance Goal 5.2.3.2: HPPG: Conserve valuable natural resources by reducing NASA's energy and water use. (Rationale for change: HPPG completed. Energy efficiency efforts continue to be tracked and reported elsewhere.)
- APG 5.2.3.2: ECR-12-1: Reduce energy intensity use annually by three percent from an FY 2003 baseline. (Rationale for change: HPPG completed. Energy efficiency efforts continue to be tracked and reported elsewhere.)

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- APG 5.2.3.2: ECR-12-2: Reduce potable water use annually by two percent from an FY 2007 baseline. (Rationale for change: HPPG completed. Energy efficiency efforts continue to be tracked and reported elsewhere.)
- APG 5.2.3.2: ECR-12-3: Reduce fleet vehicle energy use annually by two percent of petroleum products from an FY 2005 baseline. (Rationale for change: HPPG completed. Energy efficiency efforts continue to be tracked and reported elsewhere.)
- Performance Goal 5.5.1.1: HPPG: Establish an independent non-profit (NPO) organization to enhance the utilization of the ISS as a National Laboratory. (Rationale for change: HPPG completed.)
- APG 5.5.1.1: ISS-12-6: Facilitate non-profit organization (NPO) implementation of its initial grants solicitation process. (Rationale for change: HPPG completed.)
- Efficiency Measure APG AMO-12-20: Maintain system execution time during the year-end close process at FY 2010 baseline. (Rationale for change: Included in original submission erroneously.)

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*\*Measures that have been revised.*

*\*\* The Performance Goals in support of Earth Science, Heliophysics, Planetary Science, and Astrophysics themes are distinct activities supporting the scientific objectives established in NASA's [Strategic Plan](#)*

FY 2012 Performance Plan			
Measure #	Description	Contributing Theme	Contributing Program
<b>Strategic Goal 1</b>	<b>Extend and sustain human activities across the solar system.</b>		
Outcome 1.1	Sustain the operation and full use of the International Space Station (ISS) and expand efforts to utilize the ISS as a National Laboratory for scientific, technological, diplomatic, and educational purposes and for supporting future objectives in human space exploration.		
Performance Goal 1.1.1.1	Maintain capability for six on-orbit crew members.		
APG 1.1.1.1: ISS-12-1*	In concert with the International Partners, maintain a continuous six crew capability on the ISS by coordinating and managing resources, logistics, systems, and operational procedures.	International Space Station	International Space Station
Performance Goal 1.1.1.2	HPPG: Safely fly out the Space Shuttle manifest and retire the fleet.		
APG 1.1.1.2: SSP-12-1*	Ensure the Space Shuttle Discovery is ready for transport to its final display location.	Space Shuttle	Space Shuttle
Performance Goal 1.1.1.3	Provide cargo and crew transportation to support on-orbit crew members and utilization.		
APG 1.1.1.3: ISS-12-2	Fly the ISS spares, logistics, and utilization hardware as agreed to by the International Partners in the ISS transportation plan.	International Space Station	International Space Station
APG 1.1.1.3: ISS-12-3	Complete at least two flights to the ISS by U.S.-developed cargo delivery systems.	International Space Station	International Space Station
Performance Goal 1.1.1.4	Maintain and operate a safe and functional ISS.		
APG 1.1.1.4: ISS-12-4	Provide 100 percent of planned on-orbit resources (including power, data, crew time, logistics, and accommodations) needed to support research.	International Space Station	International Space Station
APG 1.1.1.4: ISS-12-5	Achieve zero Type-A (damage to property at least \$1 million or death) or Type-B (damage to property at least \$250 thousand or permanent disability or hospitalization of three or more persons) mishaps.	International Space Station	International Space Station
Performance Goal 1.1.2.1	Advance knowledge of long-duration human space flight by establishing agreements with organizations to enable full utilization of the ISS.		
APG 1.1.2.1: ISS-12-6*	Accomplish a minimum of 90 percent of the on-orbit research objectives, as baselined by NASA and ISS Non-profit organization (NPO).	International Space Station	International Space Station
Performance Goal 1.1.2.2	Conduct basic and applied biological and physical research to advance and sustain U.S. scientific expertise.		

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Measure #	Description	Contributing Theme	Contributing Program
APG 1.1.2.2: ISS-12-7*	Conduct flight definition review for at least five flight experiments in fundamental space biology.	International Space Station	International Space Station
APG 1.1.2.2: ISS-12-8*	Deliver at least two physical sciences payloads for launch to the ISS.	International Space Station	International Space Station
APG 1.1.2.2: ISS-12-9*	Conduct at least five experiments in combustion, fluids, or materials sciences on the ISS.	International Space Station	International Space Station
Outcome 1.2	Develop competitive opportunities for the commercial community to provide best value products and services to low Earth orbit and beyond.		
Performance Goal 1.2.1.1	Develop competitive opportunities for the commercial community to provide best value products and services to low Earth orbit and beyond.		
APG 1.2.1.1: CS-12-1*	Perform Commercial Orbital Transportation Services (COTS) cargo demonstration missions and continue commercial crew transportation systems development.	Commercial Spaceflight	Commercial Cargo
Performance Goal 1.2.1.2	Develop and document evaluation and certification processes for an integrated commercial crew transportation system.		
APG 1.2.1.2: CS-12-2*	Baseline ISS Crew Transportation and Service Requirements document, CTS-REQ-1130, and Crew Transportation Technical Standards and Design Evaluation Criteria document, CCT-STD-1140.	Commercial Spaceflight	Commercial Crew
Outcome 1.3	Develop an integrated architecture and capabilities for safe crewed and cargo missions beyond low Earth orbit.		
Performance Goal 1.3.1.1	Complete design reviews for Space Launch System (SLS).		
APG 1.3.1.1: ESD-12-1*	Successfully complete the Space Launch System (SLS) Systems Requirements Review (SRR).	Exploration Systems and Development	Space Launch Systems
Performance Goal 1.3.1.2*	Complete design reviews for Orion Multi-Purpose Crew Vehicle (MPCV).		
APG 1.3.1.2: ESD-12-2*	Complete testing of Orion Multi-Purpose Crew Vehicle (MPCV) Ground Test Article (GTA).	Exploration Systems and Development	Orion Multi-Purpose Crew Vehicle
Performance Goal 1.3.2.1*	Develop technologies that will enable biomedical research and mitigate health risks associated with human space exploration missions.		
APG 1.3.2.1: ERD-12-1	Develop and release two NASA Research Announcements that solicit from the external biomedical research community the highest quality proposals to mitigate space human health risks.	Exploration Research and Development	Human Research
Performance Goal 1.3.2.2	Perform research to ensure that future human crews are protected from the deleterious effects of space radiation.		
APG	Release Acute Radiation Risk Model Version 2 to assess effects of solar particle events	Exploration	Human Research

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Measure #	Description	Contributing Theme	Contributing Program
1.3.2.2: ERD-12-2	during exploration missions.	Research and Development	
Performance Goal 1.3.2.3	Develop exploration medical capabilities for long-duration space missions.		
APG 1.3.2.3: ERD-12-3	Deliver the next-generation space biomedical ultrasound device to enhance the Human Research Facility capability on the ISS through 2020.	Exploration Research and Development	Human Research
Performance Goal 1.3.3.1	Prioritize the knowledge of hazards, opportunities, and potential destinations for human space exploration that will be of use to future operations of an integrated architecture for human space exploration.		
APG 1.3.3.1: ERD-12-4	In collaboration with the Planetary Science Division, develop a plan to return data that will support the selection of destinations and reduce risk for future human space exploration missions.	Exploration Research and Development	Advanced Exploration Systems
<b>Strategic Goal 2</b>	<b>Expand scientific understanding of the Earth and the universe in which we live.</b>		
Outcome 2.1	Advance Earth system science to meet the challenges of climate and environmental change.		
Performance Goal 2.1.1.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.1: "Improve understanding of and improve the predictive capability for changes in the ozone layer, climate forcing, and air quality associated with changes in atmospheric composition.")		
APG 2.1.1.1: ES-12-1	Demonstrate planned progress in understanding and improving predictive capability for changes in the ozone layer, climate forcing, and air quality associated with changes in atmospheric composition. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs
Performance Goal 2.1.1.2**	By 2015, launch at least two missions in support of objective 2.1.1.		
APG 2.1.1.2: ES-12-2	Complete the Orbiting Carbon Observatory-2 (OCO-2) Systems Integration Review.	Earth Science	Earth System Science Pathfinder
APG 2.1.1.2: ES-12-3	Complete the Earth Venture-1 (EV-1) Investigation Readiness Reviews (IRR) and begin initial field campaigns.	Earth Science	Earth System Science Pathfinder
Performance Goal 2.1.2.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.2: "Enable improved predictive capability for weather and extreme weather events.")		
APG 2.1.2.1: ES-12-4	Demonstrate planned progress in enabling improved predictive capability for weather and extreme weather events. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs
Performance Goal 2.1.2.2**	By 2015, launch at least two missions in support of objective 2.1.2.		
APG 2.1.2.2: ES-12-5	Complete the Global Precipitation Measurement (GPM) Pre-Environmental Review.	Earth Science	Earth Systematic Missions

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Measure #	Description	Contributing Theme	Contributing Program
APG 2.1.2.2: ES-12-3	Complete the Earth Venture-1 Investigation Readiness Reviews (IRR) and begin initial field campaigns.	Earth Science	Earth System Science Pathfinder
Performance Goal 2.1.3.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.3: "Quantify, understand, and predict changes in Earth's ecosystems and biogeochemical cycles, including the global carbon cycle, land cover, and biodiversity.")		
APG 2.1.3.1: ES-12-6	Demonstrate planned progress in quantifying, understanding, and predicting changes in Earth's ecosystems and biogeochemical cycles, including the global carbon cycle, land cover, and biodiversity. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs
Performance Goal 2.1.3.2**	By 2015, launch at least two missions in support of objective 2.1.3.		
APG 2.1.3.2: ES-12-7	Complete the Landsat Data Continuity Mission (LDCM) Systems Integration Review.	Earth Science	Earth Systematic Missions
APG 2.1.3.2: ES-12-2	Complete the Orbiting Carbon Observatory-2 (OCO-2) Systems Integration Review.	Earth Science	Earth System Science Pathfinder
APG 2.1.3.2: ES-12-3	Complete the Earth Venture-1 (EV-1) Investigation Readiness Reviews (IRR) and begin initial field campaigns.	Earth Science	Earth System Science Pathfinder
Performance Goal 2.1.4.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.4: "Quantify the key reservoirs and fluxes in the global water cycle and assess water cycle change and water quality.")		
APG 2.1.4.1: ES-12-8	Demonstrate planned progress in quantifying the key reservoirs and fluxes in the global water cycle and assessing water cycle change and water quality. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs
Performance Goal 2.1.4.2**	By 2015, launch at least two missions in support of objective 2.1.4.		
APG 2.1.4.2: ES-12-5	Complete the Global Precipitation Measurement (GPM) Pre-Environmental Review.	Earth Science	Earth Systematic Missions
APG 2.1.4.2: ES-12-9	Successfully complete the Soil Moisture Active-Passive (SMAP) Critical Design Review.	Earth Science	Earth Systematic Missions
Performance Goal 2.1.5.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.5: "Improve understanding of the roles of the ocean, atmosphere, land and ice in the climate system and improve predictive capability for its future evolution.")		
APG 2.1.5.1: ES-12-10	Demonstrate planned progress in understanding the roles of ocean, atmosphere, land, and ice in the climate system and improving predictive capability for future evolution. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs

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Measure #	Description	Contributing Theme	Contributing Program
APG 2.1.5.1: ES-12-11	Achieve mission success criteria for the Ocean Surface Topography Mission (OSTM).	Earth Science	Earth Systematic Missions
Performance Goal 2.1.5.2	HPPG: Study Earth from space to understand climate change, weather, and human impact on our planet by launching at least two missions by 2015.		
APG 2.1.5.2: ES-12-12	Launch the National Polar-orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP).	Earth Science	Earth Systematic Missions
Performance Goal 2.1.5.3**	By 2015, launch at least three missions in support of objective 2.1.5.		
APG 2.1.5.3: ES-12-13*	Complete the Ice, Cloud, and Land Elevation Satellite-2 (ICESat-2) Preliminary Design Review.	Earth Science	Earth Systematic Missions
APG 2.1.5.3: ES-12-2	Complete the Orbiting Carbon Observatory-2 (OCO-2) Systems Integration Review.	Earth Science	Earth System Science Pathfinder
Performance Goal 2.1.6.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.6: "Characterize the dynamics of Earth's surface and interior and form the scientific basis for the assessment and mitigation of natural hazards and response to rare and extreme events.")		
APG 2.1.6.1: ES-12-14	Demonstrate planned progress in characterizing the dynamics of Earth's surface and interior and forming the scientific basis for the assessment and mitigation of natural hazards and response to rare and extreme events. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs
Performance Goal 2.1.6.2**	By 2015, launch at least one mission in support of objective 2.1.6.		
APG 2.1.6.2: ES-12-7	Complete the Landsat Data Continuity Mission (LDCM) Systems Integration Review.	Earth Science	Earth Systematic Missions
Performance Goal 2.1.7.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.7: "Enable the broad use of Earth system science observations and results in decision-making activities for societal benefits.")		
APG 2.1.7.1: ES-12-15*	Advance at least 25 percent of decision-support projects at least one Applications Readiness Level. The Applications Readiness Level is a nine-stage index for tracking the advancement of an Earth science applications project along a continuum from initial concept through development and transition to operational use.	Earth Science	Applied Sciences
APG 2.1.7.1: ES-12-16*	Increase the number of science data products delivered to Earth Observing System Data and Information System (EOSDIS) users.	Earth Science	Earth Science Multi-Mission Operations
APG 2.1.7.1: ES-12-17*	Maintain a high level of customer satisfaction, as measured by exceeding the most recently available federal government average rating of the Customer Satisfaction Index.	Earth Science	Earth Science Multi-Mission Operations
Outcome 2.2	Understand the Sun and its interactions with the Earth and the solar system.		
Performance Goal 2.2.1.1 **	Provide national scientific capabilities through necessary skilled researchers and supporting		

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Measure #	Description	Contributing Theme	Contributing Program
	knowledge base. (In support of objective 2.2.1: “Improve understanding of the fundamental physical processes of the space environment from the Sun to Earth, to other planets, and beyond to the interstellar medium.”)		
APG 2.2.1.1: HE-12-1	Demonstrate planned progress in understanding the fundamental physical processes of the space environment from the Sun to Earth, to other planets, and beyond to the interstellar medium. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Heliophysics	Multiple Programs
Performance Goal 2.2.1.2*/**	By 2015, launch two missions in support of objective 2.2.1.		
APG 2.2.1.2: HE-12-2	Complete the Magnetospheric MultiScale (MMS) Systems Integration Review.	Heliophysics	Solar Terrestrial Probes
APG 2.2.1.2: HE-12-3	Complete the Geospace Radiation Belt Storm Probes Launch Readiness Review.	Heliophysics	Living with a Star
Performance Goal 2.2.2.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.2.2: “Improve understanding of how human society, technological systems, and the habitability of planets are affected by solar variability interacting with planetary magnetic fields and atmospheres.”)		
APG 2.2.2.1: HE-12-4	Demonstrate planned progress in understanding how human society, technological systems, and the habitability of planets are affected by solar variability interacting with planetary magnetic fields and atmospheres. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Heliophysics	Multiple Programs
Performance Goal 2.2.2.2*/**	By 2015, launch two missions in support of objective 2.2.2.		
APG 2.2.2.2: HE-12-2	Complete the Magnetospheric MultiScale (MMS) Systems Integration Review.	Heliophysics	Solar Terrestrial Probes
APG 2.2.2.2: HE-12-3	Complete the Geospace Radiation Belt Storm Probes Launch Readiness Review.	Heliophysics	Living with a Star
Performance Goal 2.2.3.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.2.3: “Maximize the safety and productivity of human and robotic explorers by developing the capability to predict extreme and dynamic conditions in space.”)		
APG 2.2.3.1: HE-12-5	Demonstrate planned progress in maximizing the safety and productivity of human and robotic explorers by developing the capability to predict the extreme and dynamic conditions in space. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Heliophysics	Multiple Programs
Performance Goal 2.2.3.2*/**	By 2017, launch at least two missions in support of objective 2.2.3.		
APG	Complete the Geospace Radiation Belt Storm Probes Launch Readiness Review.	Heliophysics	Living with a Star

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Measure #	Description	Contributing Theme	Contributing Program
2.2.3.2: HE-12-3			
Outcome 2.3	Ascertain the content, origin, and evolution of the solar system and the potential for life elsewhere.		
Performance Goal 2.3.1.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.3.1: "Inventory solar system objects and identify the processes active in and among them.")		
APG 2.3.1.1: PS-12-1	Demonstrate planned progress in inventorying solar system objects and identifying the processes active in and among them. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Planetary Science	Multiple Programs
Performance Goal 2.3.1.2**	By 2017, launch at least two missions in support of objective 2.3.1.		
APG 2.3.1.2: PS-12-2	Complete New Frontiers 3 Preliminary Design Review.	Planetary Science	New Frontiers
APG 2.3.1.2: PS-12-3	Complete the Discovery 12 mission concept studies.	Planetary Science	Discovery
Performance Goal 2.3.2.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.3.2: "Improve understanding of how the Sun's family of planets, satellites, and minor bodies originated and evolved.")		
APG 2.3.2.1: PS-12-4	Demonstrate planned progress in understanding how the Sun's family of planets, satellites, and minor bodies originated and evolved. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Planetary Science	Multiple Programs
APG 2.3.2.1: PS-12-5	Complete MESSENGER mission success criteria.	Planetary Science	Discovery
Performance Goal 2.3.2.2**	By 2015, launch at least three missions in support of objective 2.3.2.		
APG 2.3.2.2: PS-12-2	Complete the New Frontiers 3 Preliminary Design Review.	Planetary Science	New Frontiers
APG 2.3.2.2: PS-12-6	Complete the Lunar Atmosphere and Dust Environment Explorer (LADEE) Systems Integration Review.	Planetary Science	Lunar Quest
APG 2.3.2.2: PS-12-18*	Complete GRAIL mission success criteria.	Planetary Science	Discovery
Performance Goal 2.3.3.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.3.3: "Improve understanding of the processes that determine the history and future of habitability of environments on Mars and other solar system bodies.")		

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Measure #	Description	Contributing Theme	Contributing Program
APG 2.3.3.1 : PS-12-7	Demonstrate planned progress in understanding the processes that determine the history and future of habitability of environments on Mars and other solar system bodies. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Planetary Science	Multiple Programs
Performance Goal 2.3.3.2*/**	By 2015, launch at least two missions in support of objective 2.3.3.		
APG 2.3.3.2: PS-12-8	Complete the Mars Science Laboratory (MSL) Launch Readiness Review.	Planetary Science	Mars Exploration
APG 2.3.3.2: PS-12-9	Complete the Mars Atmosphere and Volatile Evolution Mission (MAVEN) Systems Integration Review.	Planetary Science	Mars Exploration
Performance Goal 2.3.4.1 **	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.3.4: "Improve understanding of the origin and evolution of Earth's life and biosphere to determine if there is or ever has been life elsewhere in the universe.")		
APG 2.3.4.1 : PS-12-11	Demonstrate planned progress in understanding the origin and evolution of life on Earth and throughout the biosphere to determine if there is or ever has been life elsewhere in the universe. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Planetary Science	Multiple Programs
Performance Goal 2.3.5.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.3.5: "Identify and characterize small bodies and the properties of planetary environments that pose a threat to terrestrial life or exploration or provide potentially exploitable resources.")		
APG 2.3.5.1: PS-12-12	Demonstrate planned progress in identifying and characterizing small bodies and the properties of planetary environments that pose a threat to terrestrial life or exploration or provide potentially exploitable resources. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Planetary Science	Multiple Programs
Performance Goal 2.3.5.2*	Return data for selection of destinations in order to lower risk for human space exploration beyond low Earth orbit.		
APG 2.3.5.2: PS-12-13	Demonstrate planned progress in characterizing potentially hazardous objects that are possible destinations for future human space exploration.	Planetary Science	Multiple Programs
Outcome 2.4	Discover how the universe works, explore how it began and evolved, and search for Earth-like planets.		
Performance Goal 2.4.1.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.4.1: "Improve understanding of the origin and destiny of the universe, and the nature of black holes, dark energy, dark matter, and		

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Measure #	Description	Contributing Theme	Contributing Program
	gravity.”)		
APG 2.4.1.1: AS-12-1	Demonstrate planned progress in understanding the origin and destiny of the universe, and the nature of black holes, dark energy, dark matter, and gravity. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Astrophysics	Multiple Programs
Performance Goal 2.4.1.2*/**	By 2015, launch at least one mission in support of objective 2.4.1.		
APG 2.4.1.2: AS-12-2	Complete the Nuclear Spectroscopic Telescope Array (NuSTAR) Launch Readiness Review.	Astrophysics	Astrophysics Explorer
Performance Goal 2.4.2.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.4.2: “Improve understanding of the many phenomena and processes associated with galaxy, stellar, and planetary system formation and evolution from the earliest epochs to today.”)		
APG 2.4.2.1: AS-12-3	Demonstrate planned progress in understanding the many phenomena and processes associated with galaxy, stellar, and planetary system formation and evolution from the earliest epochs to today. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Astrophysics	Multiple Programs
Performance Goal 2.4.2.2**	Design and assemble the James Webb Space Telescope (JWST).		
APG 2.4.2.2: JWST-12-1	Begin integration of James Webb Space Telescope (JWST) flight optics into Optical Telescope Element (OTE).	James Webb Space Telescope	James Webb Space Telescope
Performance Goal 2.4.2.3**	Develop and operate an airborne infrared astrophysics observatory.		
APG 2.4.2.3: AS-12-4	Initiate the Stratospheric Observatory for Infrared Astronomy (SOFIA) Segment 3 Aircraft modifications and upgrades.	Astrophysics	Cosmic Origins
Performance Goal 2.4.3.1**	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.4.3: “Generate a census of extra-solar planets and measure their properties.”)		
APG 2.4.3.1: AS-12-5	Demonstrate planned progress in generating a census of extra-solar planets and measuring their properties. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Astrophysics	Multiple Programs
<b>Strategic Goal 3</b>	<b>Create the innovative new space technologies for our exploration, science, and economic future.</b>		
Outcome 3.1	Sponsor early stage innovation in space technologies in order to improve the future capabilities of NASA, other government agencies, and the aerospace industry.		
Performance Goal 3.1.1.1*	Develop and advance space technologies that support NASA’s science, exploration and		

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Measure #	Description	Contributing Theme	Contributing Program
	discovery missions.		
APG 3.1.1.1: ST-12-1*	Research, study or develop concepts of 100 technologies as documented in technology reports or plans.	Space Technology	Crosscutting Space Technology Development
Performance Goal 3.1.1.2	Provide cash prize incentives to non-traditional sources for innovations of interest and value to NASA and the Nation.		
APG 3.1.1.2: ST-12-2*	Conduct at least one Centennial Challenges competition.	Space Technology	Crosscutting Space Technology Development
Performance Goal 3.1.1.4	Increase the proportion of Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) technologies successfully infused into NASA programs/projects.		
APG 3.1.1.4: ST-12-4*	At least 25 percent of the Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) Phase II technology projects awarded between 2005-2009 will be infused into NASA programs and projects.	Space Technology	SBIR and STTR
Performance Goal 3.1.1.5	Increase the Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) Phase III contracts initiated or expanded.		
APG 3.1.1.5: ST-12-5*	At least 20 of the Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) technologies will be advanced to Phase III (received non-SBIR/STTR funding).	Space Technology	SBIR and STTR
Outcome 3.2	Infuse game changing and crosscutting technologies throughout the Nation's space enterprise, to transform the Nation's space mission capabilities.		
Performance Goal 3.2.1.1*	Transition developed game changing technologies to the technology demonstration programs or directly to Mission Directorates for mission insertion, and/or for use by other U.S. space activities.		
APG 3.2.1.1: ST-12-7*	Initiate three game changing technology projects.	Space Technology	Crosscutting Space Technology Development
Performance Goal 3.2.3.1	Demonstrate small satellite capabilities with game changing and crosscutting potential for the government and commercial space sectors.		
APG 3.2.3.1: ST-12-9	Initiate at least one new small satellite mission that will demonstrate game changing or crosscutting technologies in space.	Space Technology	Crosscutting Space Technology Development
Performance Goal 3.2.4.1*	Infuse game changing and crosscutting technologies into future NASA missions or into national space activities through flight or relevant environment demonstrations.		

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Measure #	Description	Contributing Theme	Contributing Program
APG 3.2.4.1: ST-12-10*	Complete preliminary design of at least one system-level technology for flight or relevant environment demonstration.	Space Technology	Crosscutting Space Technology Development
Performance Goal 3.2.5.1	Perform sub-orbital, simulated zero-gravity and other space analog flight opportunities to develop and demonstrate emerging ideas and technologies.		
APG 3.2.5.1: ST-12-11*	Select and fly technology payloads from NASA, other government agencies, industry, and academia using flight services procured from at least three commercial reusable suborbital or parabolic platform providers.	Space Technology	Crosscutting Space Technology Development
Outcome 3.3	Develop and demonstrate the critical technologies that will make NASA's exploration, science, and discovery missions more affordable and more capable.		
Performance Goal 3.3.1.1	Demonstrate robotic technologies that support in-space operations, scientific discovery, and work as assistants with the crew.		
APG 3.3.1.1: ERD-12-5*	Develop telerobotic software for remote manipulation of Robonaut 2.	Space Technology	Exploration Technology Development
Performance Goal 3.3.2.1*	Develop advanced spacesuits to improve the ability of astronauts to conduct extravehicular activity (EVA) operations in space including assembly and service of in-space systems and exploration of surfaces of the Moon, Mars, near-Earth objects (NEOs), and other small bodies.		
APG 3.3.2.1: ERD-12-6*	Complete tests of Extra Vehicular Activity (EVA) Portable Life Support System (PLSS) subsystem in a vacuum chamber environment.	Exploration Research and Development	Advanced Exploration Systems
Performance Goal 3.3.2.2	Develop technologies and mission concepts for demonstrating in-space cryogenic propellant storage and transfer making exploration and science missions more affordable and capable.		
APG 3.3.2.2: ST-12-12*	Complete the Mission Concept Review for the Cryogenic Propellant Storage and Transfer demonstration.	Space Technology	Exploration Technology Development
Outcome 3.4	Facilitate the transfer of NASA technology and engage in partnerships with other government Agencies, industry, and international entities to generate U.S. commercial activity and other public benefits.		
Performance Goal 3.4.1.1	Establish 12 technology-related significant partnerships that create value for programs and projects. Track both quantitative dollar value and qualitative benefits to NASA (e.g., reduced volume or mass, improved safety) per year.		
APG 3.4.1.1: ST-12-13	Establish at least 12 technology-related significant partnerships during FY 2012.	Space Technology	Partnership Development and Strategic Integration
Performance Goal 3.4.1.2	Complete 30 technology transfer agreements with the commercial and academic community through such mechanisms as licenses, software use agreements, facility use		

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Measure #	Description	Contributing Theme	Contributing Program
	agreements, and Space Act Agreements per year.		
APG 3.4.1.2: ST-12-14	Complete at least 30 technology transfer agreements during FY 2012.	Space Technology	SBIR and STTR
Performance Goal 3.4.1.5	Document, coordinate, and prioritize Agency-level technology strategic investments to ensure NASA has a balanced portfolio of both near-term NASA mission (pull) technologies and longer-term transformational (push) technologies that benefit both Agency programs and national needs.		
APG 3.4.1.5: ST-12-17*	Ensure that 75 percent of all NASA Space Technology Program's projects are recorded in the portfolio database.	Space Technology	Partnership Development and Strategic Integration
<b>Strategic Goal 4</b>	<b>Advance aeronautics research for societal benefit.</b>		
Outcome 4.1	Develop innovative solutions and advanced technologies through a balanced research portfolio to improve current and future air transportation.		
Performance Goal 4.1.1.1	Transfer knowledge to the aviation community to better manage safety in aviation.		
APG 4.1.1.1: AR-12-1	Develop first generation engine icing performance degradation parametric simulation capability.	Aeronautics	Aviation Safety
APG 4.1.1.1: AR-12-2	Provide static code analysis techniques for certification.	Aeronautics	Aviation Safety
APG 4.1.1.1: AR-12-3	Develop concept of operations for an integrated vehicle health assurance system.	Aeronautics	Aviation Safety
APG 4.1.1.1: AR-12-4	Demonstrate algorithm to predict at least three anomalies in massive datasets.	Aeronautics	Aviation Safety
Performance Goal 4.1.2.1	HPPG: Increase efficiency and throughput of aircraft operations during arrival phase of flight.	Aeronautics	Airspace Systems
APG 4.1.2.1: AR-12-5	Develop Initial Weather Translation Models.	Aeronautics	Airspace Systems
APG 4.1.2.1: AR-12-6	Demonstrate safe Interval Management Procedures to a Single Airport with dependent parallel runways.	Aeronautics	Airspace Systems
APG 4.1.2.1: AR-12-7	NASA will provide the results of the human-in-the-loop (HITL) simulations and the field trial to the Federal Aviation Administration (FAA) as they are completed, with the final report being provided in September 2012. (HPPG milestone)	Aeronautics	Airspace Systems
Performance Goal 4.1.3.1*	Deliver tools, technologies, and knowledge that can be used to more efficiently and effectively design future air vehicles and their components to overcome national performance and capability challenges.		
APG 4.1.3.1: AR-12-8	Characterize gaseous and particulate emissions of hydro treated renewable jet fuel as a potential carbon dioxide (CO2) neutral aviation fuel.	Aeronautics	Fundamental Aeronautics

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Measure #	Description	Contributing Theme	Contributing Program
APG 4.1.3.1: AR-12-9	Demonstrate drag reduction benefits of active flow control for a representative rotorcraft fuselage configuration.	Aeronautics	Fundamental Aeronautics
APG 4.1.3.1: AR-12-10	Validate the effectiveness of Micro-array Flow Control devices for improving performance and flow quality in low-boom supersonic propulsion inlets.	Aeronautics	Fundamental Aeronautics
APG 4.1.3.1: AR-12-11	Demonstrate First Generation Integrated Multi-Disciplinary Simulation Tool for Analysis and Design of Reusable Air-Breathing Launch Vehicles.	Aeronautics	Fundamental Aeronautics
Outcome 4.2	Conduct systems-level research on innovative and promising aeronautics concepts and technologies to demonstrate integrated capabilities and benefits in a relevant flight and/or ground environment.		
Performance Goal 4.2.1.1	Reduce technical risk by conducting research at an integrated system-level on promising aeronautical concepts and technologies in a relevant environment.		
APG 4.2.1.1: AR-12-12	Demonstrate low-weight, damage-tolerant stitched composite structural concept on curved panel subjected to combined tension and internal pressure loads.	Aeronautics	Integrated Systems Research
APG 4.2.1.1: AR-12-13	Develop integrated Human Systems Integration, Communications, and Separation Assurance subproject test concept and Phase 2 test objectives necessary to achieve human-in-the-loop simulation and flight test series milestones supporting the Unmanned Aircraft Systems (UAS) Integration in the National Airspace System (NAS) Project.	Aeronautics	Integrated Systems Research
<b>Strategic Goal 5</b>	<b>Enable program and institutional capabilities to conduct NASA's aeronautics and space activities.</b>		
Outcome 5.1	Identify, cultivate, and sustain a diverse workforce and inclusive work environment that is needed to conduct NASA missions.		
Performance Goal 5.1.1.1*	Define and build the workforce skills and competencies needed for the Agency's technology development and deep space exploration.		
APG 5.1.1.1: AMO-12-1*	Sustain (from the previous fiscal year) NASA's Innovation Score, as measured by the Innovation-related questions of the Employee Viewpoint Survey (EVS), by taking actions such as refining and updating human capital policies, programs, and systems to support and encourage innovation to meet NASA's missions.	Agency Management and Operations	Agency Management
Performance Goal 5.1.1.5*	Advance a workplace environment of equal opportunity, in which discrimination allegations, including harassing conduct and retaliation for equal employment opportunity (EEO) activity, are addressed promptly and effectively and in which reasonable accommodations are provided to individuals with disabilities.		

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Measure #	Description	Contributing Theme	Contributing Program
APG 5.1.1.5: AMO-12-7*	Implement eight planned actions to address two identified potential employment barriers concerning individuals with disabilities, Asian/Pacific Islander, African American, Hispanic and female employees, based on the NASA Model Equal Employment Opportunity (EEO) Agency Plan.	Agency Management and Operations	Agency Management
Performance Goal 5.1.1.6	Implement an Agency-wide Diversity and Inclusion Framework to develop a more demographically diverse workforce and a more inclusive work environment.		
APG 5.1.1.6: AMO-12-8*	Implement an Agency Diversity and Inclusion (D&I) Strategic Plan aligned with the Government-wide D&I Strategic Plan.	Agency Management and Operations	Agency Management
Performance Goal 5.1.2.1	Assure that student participants in NASA higher education projects are representative of the diversity of the Nation.		
APG 5.1.2.1: ED-12-1	Achieve 40 percent participation of underserved and underrepresented (in race and/or ethnicity) in NASA higher education projects.	Education	Multiple Programs
APG 5.1.2.1: ED-12-2	Achieve 45 percent participation of women in NASA higher education projects.	Education	Multiple Programs
Outcome 5.2	Ensure vital assets are ready, available, and appropriately sized to conduct NASA's missions.		
Performance Goal 5.2.1.1*	Through 2015, assure the safety of NASA's activities and reduce damage to assets through the development, implementation, and oversight of Agency-wide safety, reliability, maintainability, and quality assurance policies and procedures.		
APG 5.2.1.1: AMO-12-9*	Assure zero fatalities or permanent disabling injuries to the public resulting from NASA activities during FY 2012.	Agency Management and Operations	Safety and Mission Success
APG5.2.1.1: AMO-12-10*	Maintain a Total Case Rate and Lost Time Case Rate that meets the goals of the President's Protecting Our Workers and Ensuring Reemployment (POWER) initiative.	Agency Management and Operations	Safety and Mission Success
APG 5.2.1.1: AMO-12-11*	Reduce damage to NASA assets (excluding launched flight hardware) by two percent during FY 2012, based on a five-year running average (that also excludes launched flight hardware).	Agency Management and Operations	Safety and Mission Success
Performance Goal 5.2.2.1*	By 2014, consolidate and centralize the management of information technology (IT) enterprise services for end user services, communications, and enterprise applications.		
APG 5.2.2.1: AMO-12-12*	Achieve full operational capability (FOC) for three service offices as part of the NASA Information Technology Infrastructure Integration Program (I3P).	Agency Management and Operations	Agency IT Services (AITS)

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Measure #	Description	Contributing Theme	Contributing Program
Performance Goal 5.2.2.2	By 2015, implement a capability to identify and prevent unauthorized intrusions on the NASA institutional and mission networks.		
APG 5.2.2.2: AMO-12-13	Implement intrusion detection sensors monitored by the NASA Security Operations Center (SOC) on 75 percent of NASA institutional network monitoring sites.	Agency Management and Operations	Agency IT Services (AITS)
Performance Goal 5.2.2.3	By 2014, decommission the Agency Administrative mainframe computer.		
APG 5.2.2.3: AMO-12-14	Migrate or retire all administrative systems from the Agency Administrative mainframe computer.	Agency Management and Operations	Agency IT Services (AITS)
Performance Goal 5.2.2.4	By 2015, reduce data center energy consumption by 30 percent.		
APG 5.2.2.4: AMO-12-15	Reduce the number of NASA data centers by 10 percent.	Agency Management and Operations	Agency IT Services (AITS)
Performance Goal 5.2.2.5*	Promote knowledge sharing and collaboration by effectively communicating IT Labs initiatives, projects and resources for information technology (IT) across NASA in support of the Agency's Mission.		
APG 5.2.2.5: AMO-12-16*	Identify innovative information technologies and create active participation opportunities for NASA scientists and engineers to collaborate on missions.	Agency Management and Operations	Agency IT Services (AITS)
Performance Goal 5.2.3.1	Consolidate functions and offices to reduce real property need, and use Agency Integrated Master Plan to identify and dispose of excess and aged facilities beyond useful life.		
APG 5.2.3.1: AMO-12-17	Finalize remaining Center Master Plans into the Agency Integrated Master Plan.	Agency Management and Operations	Agency Management
APG 5.2.3.1: COF-12-1	Initiate facilities demolition process for five significant Agency facilities in addition to demolition processes initiated in FY 2011.	Construction of Facilities	Institutional CoF
Outcome 5.3	Ensure the availability to the Nation of NASA-owned strategically important test capabilities.		
Performance Goal 5.3.1.1	Develop and execute the Rocket Propulsion Test (RPT) Master Plan.		
APG 5.3.1.1: SFS-12-1	Meet Rocket Propulsion Test (RPT) Master Plan requirements for year one.	Space and Flight Support	Rocket Propulsion Test
Performance Goal 5.3.2.1	Ensure that testing capabilities are available in order to support the research, development, test and engineering milestones of NASA and Department of Defense (DoD) programs.		

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Measure #	Description	Contributing Theme	Contributing Program
APG 5.3.2.1: AR-12-14	Achieve ratings greater than 86 percent for overall quality and timeliness of Aeronautics Test Program (ATP) facility operations.	Aeronautics	Aeronautics Test
Outcome 5.4	Implement and provide space communications and launch capabilities responsive to existing and future science and space exploration missions.		
Performance Goal 5.4.1.1	Complete Launch Services Program (LSP) objectives for all NASA-managed expendable launches.		
APG 5.4.1.1: SFS-12-2	Sustain 100 percent success rate with the successful launch of NASA-managed expendable launches as identified on the Launch Services Flight Planning Board manifest.	Space and Flight Support	Launch Services
Performance Goal 5.4.1.2	Continue utilizing existing contract mechanisms and agreements with emerging launch vehicle providers to gain information for future Launch Service orders and to provide technical exchanges to enhance early launch success.		
APG 5.4.1.2: SFS-12-3	Incorporate information sharing processes into programmatic policies and incorporate into crew demonstration activities and future crew transportation service contracts.	Space and Flight Support	Launch Services
Performance Goal 5.4.2.1	By FY 2014, enable future government and commercial launching and testing from the Florida launch and range complex.		
APG 5.4.2.1: SFS-12-4*	Complete the 21st Century Space Launch Complex (21st CSLC) System Requirements Review/System Design Review.	Space and Flight Support	21st Century Space Launch Complex
Performance Goal 5.4.3.1	By 2014, launch two functionally identical Tracking and Data Relay Satellite (TDRS) spacecraft in geosynchronous orbits to replenish the Tracking and Data Relay Satellite System (TDRSS) constellation.		
APG 5.4.3.1: SFS-12-5	Complete Tracking and Data Relay Satellite (TDRS) K Pre-ship Review.	Space and Flight Support	Space Communications and Navigation
Performance Goal 5.4.3.2	By FY 2016, replace or upgrade obsolete and unsustainable systems of the TDRSS Ground Segment at the White Sands Complex (WSC).		
APG 5.4.3.2: SFS-12-6	Complete the Space Network Ground Segment Sustainment (SGSS) Preliminary Design Review (PDR).	Space and Flight Support	Space Communications and Navigation
Performance Goal 5.4.3.3	By FY 2018, replace aging and obsolete Deep Space Network (DSN) 70-meter antenna at Canberra Deep Space Communications Complex (CDSCC).		
APG 5.4.3.3: SFS-12-7	Complete Deep Space Station-35 (DSS-35) antenna fabrication at vendor.	Space and Flight Support	Space Communications and Navigation
Outcome 5.5	Establish partnerships, including innovative arrangements, with commercial, international, and other government entities to maximize mission success.		
Performance Goal 5.5.2.1	Actively engage and provide leadership in international and interagency forums.		

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Measure #	Description	Contributing Theme	Contributing Program
APG 5.5.2.1: AMO-12-18	Establish an internal Interagency Partnerships Working Group (IPWG) led by the Office of International and Interagency Relations (OIIR) to improve Agency-wide coordination of interagency partnerships and related interagency working groups.	Agency Management and Operations	Agency Management
<b>Strategic Goal 6</b>	<b>Share NASA with the public, educators, and students to provide opportunities to participate in our Mission, foster innovation, and contribute to a strong national economy.</b>		
Outcome 6.1	Improve retention of students in STEM disciplines by providing opportunities and activities along the education pipeline.		
Performance Goal 6.1.1.1	Provide educators nationwide with knowledge and tools with which to inspire students in STEM fields.		
APG 6.1.1.1: ED-12-3*	35,000 educators participate in NASA education programs.	Education	Multiple Programs
Performance Goal 6.1.2.1	Provide higher education students with authentic NASA mission-based opportunities that build knowledge and skills needed for STEM careers.		
APG 6.1.2.1: ED-12-4*	20,000 undergraduate and graduate students participate in NASA education opportunities.	Education	Multiple Programs
Performance Goal 6.1.2.2	Provide elementary and secondary students with authentic NASA mission-based opportunities that build STEM knowledge, skills and career awareness.		
APG 6.1.2.2: ED-12-5*	200,000 elementary and secondary students participate in NASA instructional and enrichment activities.	Education	Multiple Programs
APG 6.1.2.2: ED-12-6	85 percent of elementary and secondary students express interest in STEM careers following their involvement in NASA education programs.	Education	STEM Education and Accountability
Performance Goal 6.1.3.1*	Promote equal opportunity compliance and encourage best practices among NASA grant recipient institutions.		
APG 6.1.3.1: AMO-12-19*	Provide equal opportunity (EO) assessment and technical assistance, or onsite compliance assessment on-location, at a minimum of three STEM or STEM-related programs that receive NASA funding.	Agency Management and Operations	Agency Management
Outcome 6.2	Promote STEM literacy through strategic partnerships with formal and informal organizations.		
Performance Goal 6.2.1.1	Provide educator professional development experiences and materials that align to needs and opportunities identified by districts, states, Department of Education, professional organizations, and other stakeholders.		
APG 6.2.1.1: ED-12-7*	50 percent of educators use NASA resources in their curricula after participating in NASA professional development as measured by survey responses.	Education	STEM Education and Accountability
Outcome 6.3	Engage the public in NASA's missions by providing new pathways for participation.		

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# FY 2012 PERFORMANCE PLAN UPDATE

FY 2012 Performance Plan			
Measure #	Description	Contributing Theme	Contributing Program
Performance Goal 6.3.1.1	By 2015, establish an Agency-wide portfolio of participatory engagement opportunities.		
APG 6.3.1.1: AMO-12-20	Issue a competitive opportunity to engage the public in NASA's activities.	Agency Management and Operations	Agency Management
Outcome 6.4	Inform, engage and inspire the public by sharing NASA's missions, challenges, and results.		
Performance Goal 6.4.1.1	Leverage communities of practice to facilitate sharing of NASA successes and challenges with the public.		
APG 6.4.1.1: ED-12-9*	420 museums and science centers across the country actively engage the public in major NASA events.	Education	Multiple Programs
Performance Goal 6.4.2.1	Use current and emerging communications technologies to reach increasingly broad audiences.		
APG 6.4.2.1: AMO-12-21	Evaluate communication tools for impact and establish Agency best practices.	Agency Management and Operations	Agency Management
Performance Goal 6.4.3.1	Make available Agency records through the Freedom of Information Act (FOIA), Privacy Act, and Open Government Initiative in accordance with federal laws and regulations.		
APG 6.4.3.1: AMO-12-22	Finalize NASA Freedom of Information Act (FOIA) regulations.	Agency Management and Operations	Agency Management
<b>Uniform Efficiency Measures</b>			
AR-12-15*	Deliver at least 86 percent of on-time availability for operations and research facilities.	Aeronautics Research	Aeronautics Test Program
ES-12-20	Complete all development projects within 110 percent of the cost and schedule baseline.	Earth Science	Multiple Programs
ES-12-21	Deliver at least 90 percent of scheduled operating hours for all operations and research facilities.	Earth Science	Multiple Programs
ES-12-22	Peer-review and competitively award at least 90 percent, by budget, of research projects.	Earth Science	Multiple Programs
ES-12-23	Reduce time within which 80 percent of NASA Research Announcement (NRA) grants are awarded, from proposal due date to selection, by four percent per year, with a goal of 180 days.	Earth Science	Multiple Programs
HE-12-6	Complete all development projects within 110 percent of the cost and schedule baseline.	Heliophysics	Multiple Programs
HE-12-7	Deliver at least 90 percent of scheduled operating hours for all operations and research facilities.	Heliophysics	Multiple Programs
HE-12-8*	Peer-review and competitively award at least 95 percent, by budget, of research projects.	Heliophysics	Multiple Programs
HE-12-9	Reduce time within which 80 percent of NASA Research Announcement (NRA) grants are awarded, from proposal due date to selection, by four percent per year, with a goal of 180	Heliophysics	Multiple Programs

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# FY 2012 PERFORMANCE PLAN UPDATE

FY 2012 Performance Plan			
Measure #	Description	Contributing Theme	Contributing Program
	days.		
PS-12-14*	Complete all development projects within 110 percent of the cost and schedule baseline.	Planetary Science	Multiple Programs
PS-12-15*	Deliver at least 90 percent of scheduled operating hours for all operations and research facilities.	Planetary Science	Multiple Programs
PS-12-16*	Peer-review and competitively award at least 95 percent, by budget, of research projects.	Planetary Science	Multiple Programs
PS-12-17*	Reduce time within which 80 percent of NASA Research Announcement (NRA) grants are awarded, from proposal due date to selection, by four percent per year, with a goal of 180 days.	Planetary Science	Multiple Programs
AS-12-6	Complete all development projects within 110 percent of the cost and schedule baseline.	Astrophysics	Multiple Programs
AS-12-7	Deliver at least 90 percent of scheduled operating hours for all operations and research facilities.	Astrophysics	Multiple Programs
AS-12-8	Peer-review and competitively award at least 95 percent, by budget, of research projects.	Astrophysics	Multiple Programs
AS-12-9*	Maintain time within which 80 percent of NASA Research Announcement (NRA) grants are awarded, from proposal due date to selection, at no more than 180 days.	Astrophysics	Multiple Programs

*\*Measures that have been revised.*

*\*\* The Performance Goals in support of Earth Science, Heliophysics, Planetary Science, and Astrophysics themes are distinct activities supporting the scientific objectives established in NASA's [Strategic Plan](#).*

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## INTRODUCTION TO THE FY 2013 PERFORMANCE PLAN

### INTRODUCTION TO THE FY 2013 PERFORMANCE PLAN

In FY 2011, the President signed the GPRA Modernization Act of 2010, instituting a new level of performance requirements for all government agencies. The goal of this legislation is a transparent performance planning and reporting process. NASA's FY 2013 Performance Plan encompasses this approach to performance planning and reflects the current prioritization of NASA's programs and projects. The FY 2013 plan addresses NASA's near and long term goals to better clarify its planning strategy to the public. The FY 2013 plan also streamlines many of the Agency's goals to strengthen their relationship to NASA's Strategic Goals and government-wide goals. This section provides a summary of NASA's performance commitments in FY 2013.

Multi-year performance trends are incorporated into the FY 2013 Performance Plan. Figure 4 provides definitions for the ratings. NASA's method for trending multi-year performance data is to show the linkages between measures tracking similar data and annual progress for follow-on program activities. Linked measures, even if revised in subsequent years, are shown as related performance data. They are not meant to show back data for measures written exactly the same. In some cases, measures have been updated over the years to improve accuracy and data quality. For detailed information on performance ratings and measures from FY 2009 to FY 2011, visit <http://www.nasa.gov/news/budget/index.html>.

**Figure 4: Rating Criteria for Annual Performance Goals**

Timeframe: When Will the APG Be Achieved	Rating Criteria for APG Types			Rating
	Single Milestone or Deliverable	Multiple Deliverables, Targeted Performance, and Efficiencies	On-going Activities, Services, or Management Processes	
Current FY as planned.	NASA achieved the event or the deliverable met the intent of the APG within the timeframe.	The program/project reached the stated numeric target.	The intended result of the program/ project was achieved as defined by internally held success criteria.	Green
Achieve next FY (will not achieve this FY as planned).	NASA did not achieve this APG in the current fiscal year, but anticipates achieving it during the next fiscal year.			Yellow
Will not be achieved, but progress was made.	N/A	NASA failed to achieve this APG, but made significant progress as defined by reach- ing 80% of the target or other internally held success criteria.	The intended results of the pro- gram/project were not achieved in this fiscal year, but significant progress was accomplished, as defined by internally held success criteria.	
Will not be achieved.	NASA did not achieve the APG and does not antici- pate completing it within the next fiscal year.	NASA achieved less than 80% of the target or other internally held success criteria.	Neither intended results nor significant progress were achieved. The progress toward the APG does not meet standards for significant progress for the internally held suc- cess criteria.	Red
Will not be achieved due to cancellation or postponement.	NASA senior management canceled this APG and the Agency is no longer pursuing activities rel- evant to this APG or the program did not have activities relevant to the APG during the fiscal year.			White

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†FY12 trending is shown as required but ratings data will not be available until close of fiscal year.

†† The Performance Goals in support of Earth Science, Heliophysics, Planetary Science, and Astrophysics themes are distinct activities supporting the scientific objectives established in NASA's [Strategic Plan](#).

FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
<b>Strategic Goal 1</b>	<b>Extend and sustain human activities across the solar system.</b>						
Outcome 1.1	Sustain the operation and full use of the International Space Station (ISS) and expand efforts to utilize the ISS as a National Laboratory for scientific, technological, diplomatic, and educational purposes and for supporting future objectives in human space exploration.						
Performance Goal 1.1.1.1	Maintain capability for six on-orbit crew members.						
APG 1.1.1.1: ISS 13-1	In concert with the International Partners, maintain a continuous six crew capability on the ISS by coordinating and managing resources, logistics, systems, and operational procedures.	International Space Station	International Space Station	9ISS6 Green	10ISS07 Green	ISS-11-1 Green	ISS-12-1
APG 1.1.1.1: ISS 13-2	Complete at least three flights, delivering research and logistics hardware to the ISS, by U.S. developed cargo delivery systems.	International Space Station	International Space Station	9ISS6 Green	10ISS07 Green	ISS-11-1 Green	ISS-12-3
Performance Goal 1.1.2.1	Advance engineering, technology, and science research on the ISS.						
APG 1.1.2.1: ISS 13-3	Accomplish a minimum of 90 percent of the on-orbit research and technology development objectives. Objectives are baselined by NASA and the ISS Non-profit organization one month prior to each increment, which is the time period between crew rotations.	International Space Station	International Space Station	9ISS2 Green	10ISS02 Green	ISS-11-5 Green	ISS-12-6
APG 1.1.2.1: ISS 13-4	Fully utilize the ISS by ensuring that at least 75 percent of the research sites available are used.	International Space Station	International Space Station				

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FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
Performance Goal 1.1.2.2	Conduct basic and applied biological and physical research to advance and sustain U.S. scientific expertise.						
APG 1.1.2.2: ISS - 13-5	Conduct flight definition reviews for at least five flight experiments in fundamental space biology that were selected through the 2010 International Space Life Sciences Research Announcement.	International Space Station	International Space Station	9AC3 Green	10AC03 Green	ERD-11-1 Green	ERD-12-1
APG 1.1.2.2: ISS- 13-6	Deliver at least four physical sciences payloads for launch to the ISS.	International Space Station	International Space Station	9AC1 Green	10AC01 Green	ERD-11-2 Green	ERD-12-2
APG 1.1.2.2: ISS- 13-7	Conduct at least six experiments in combustion, fluids, or materials sciences on the ISS.	International Space Station	International Space Station	9AC2 Green	10AC02 Green	ERD-11-3 Green	ERD-12-3
Outcome 1.2	Develop competitive opportunities for the commercial community to provide best value products and services to low Earth orbit and beyond.						
Performance Goal 1.2.1.1	Create opportunities for interchange with commercial industry while developing competitive opportunities.						
APG 1.2.1.1: CS 13-1	Execute Space Act Agreements (SAAs) for development of a commercial Crew Transportation System (CTS).	Commercial Spaceflight	Commercial Crew	9SFS5 Green	None	CS-11-1 Green	CS-12-1
Outcome 1.3	Develop an integrated architecture and capabilities for safe crewed and cargo missions beyond low Earth orbit.						
Performance Goal 1.3.1.1	Complete design reviews for the Space Launch System (SLS).						
APG 1.3.1.1: ESD- 13-1	Complete the SLS Preliminary Design Review (PDR) and establish the technical design, cost, and schedule baseline for the SLS first flight.	Exploration Systems and Development	Space Launch Systems	None	None	HEC-11-1 Green	HEC-12-1
Performance Goal 1.3.1.2	Complete design reviews for Orion Multi-Purpose Crew Vehicle (MPCV).						
APG 1.3.1.2: ESD- 13-2	Manufacture Orion Multi-Purpose Crew Vehicle (MPCV) flight test hardware required for initial integration testing for the Exploration Flight Test 1 (EFT-1).	Exploration Systems and Development	Orion Multi-Purpose Crew Vehicle	None	None	HEC-11-2 Green	HEC-12-2
Performance Goal 1.3.2.1	Develop technologies that will enable biomedical research and mitigate health risks associated with human space exploration missions.						
APG	Complete two ISS physiological flight experiments that define	Exploration	Human Research	None	None	ERD-11-	ERD-12-

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Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
1.3.2.1: ERD 13-1	requirements for maintaining astronaut health for long-duration missions.	Research and Development				4 Green	4
Performance Goal 1.3.3.1	Prioritize the knowledge of hazards, opportunities, and potential destinations for human space exploration that will be of use to future operations of an integrated architecture for human space exploration.						
APG 1.3.3.1: ERD 13-2	Develop a set of strategic knowledge gaps on potential destinations for human spaceflight, conduct a review of these gaps by external advisory groups, and document the results in the Global Exploration Roadmap.	Exploration Research and Development	Advanced Exploration Systems	None	None	None	ERD-12-7
<b>Strategic Goal 2</b>	<b>Expand scientific understanding of the Earth and the universe in which we live.</b>						
Outcome 2.1	Advance Earth system science to meet the challenges of climate and environmental change.						
Performance Goal 2.1.1.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.1: “Improve understanding of and improve the predictive capability for changes in the ozone layer, climate forcing, and air quality associated with changes in atmospheric composition.”)						
APG 2.1.1.1: ES-13-1	Demonstrate planned progress in understanding and improving predictive capability for changes in the ozone layer, climate forcing, and air quality associated with changes in atmospheric composition. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs	9ES1 Green	10ES01 Green	ES-11-1 Green	ES-12-1
Performance Goal 2.1.1.2††	By 2015, launch at least two missions in support of objective 2.1.1.						
APG 2.1.1.2: ES-13-2	Complete the Earth Venture-2 (EV-2) Mission Definition Review (MDR).	Earth Science	Earth System Science Pathfinder	None	None	ES-11-4 Green	ES-12-3
Performance Goal 2.1.2.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.2: “Enable improved predictive capability for weather and extreme weather events.”)						
APG	Demonstrate planned progress in enabling improved predictive	Earth Science	Multiple Programs	9ES7	10ES04	ES-11-5	ES-12-4

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FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
2.1.2.1: ES-13-3	capability for weather and extreme weather events. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.			Green	Green	Green	
Performance Goal 2.1.2.2††	By 2015, launch at least two missions in support of objective 2.1.2.						
APG 2.1.2.2: ES-13-4	Complete the Global Precipitation Measurement (GPM) mission observatory environmental testing.	Earth Science	Earth Systematic Missions	9ES8 Yellow	10ES06 Green	ES-11-6 Yellow	ES-12-5
APG 2.1.2.2: ES-13-2	Complete the Earth Venture 2 (EV-2) Mission Definition Review (MDR).	Earth Science	Earth System Science Pathfinder	None	None	ES-11-4 Green	ES-12-3
Performance Goal 2.1.3.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.3: "Quantify, understand, and predict changes in Earth's ecosystems and biogeochemical cycles, including the global carbon cycle, land cover, and biodiversity.")						
APG 2.1.3.1: ES-13-5	Demonstrate planned progress in quantifying, understanding and predicting changes in Earth's ecosystems and biogeochemical cycles, including the global carbon cycle, land cover, and biodiversity. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs	9ES10 Green	10ES07 Green	ES-11-7 Green	ES-12-6
Performance Goal 2.1.3.2††	By 2015, launch at least two missions in support of objective 2.1.3.						
APG 2.1.3.2: ES-13-6	Launch the Landsat Data Continuity Mission (LDCM).	Earth Science	Earth Systematic Missions	9ES11 Green	10ES08 Green	ES-11-8 Green	ES-12-7
APG 2.1.3.2: ES-13-2	Complete the Earth Venture-2 (EV-2) Mission Definition Review (MDR).	Earth Science	Earth System Science Pathfinder	None	None	ES-11-4 Green	ES-12-3
Performance Goal 2.1.4.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.4: "Quantify the key reservoirs and fluxes in the global water cycle and assess water cycle change and water quality.")						

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### FY 2013 PERFORMANCE PLAN

FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
APG 2.1.4.1: ES-13-7	Demonstrate planned progress in quantifying the key reservoirs and fluxes in the global water cycle and assessing water cycle change and water quality. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs	9ES13 Green	10ES09 Green	ES-11-9 Green	ES-12-8
Performance Goal 2.1.4.2††	By 2015, launch at least two missions in support of objective 2.1.4.						
APG 2.1.4.2: ES-13-4	Complete the Global Precipitation Measurement (GPM) mission observatory environmental testing.	Earth Science	Earth Systematic Missions	9ES8 Yellow	10ES06 Green	ES-11-6 Yellow	ES-12-5
APG 2.1.4.2: ES-13-8	Complete the Soil Moisture Active-Passive (SMAP) Systems Integration Review (SIR).	Earth Science	Earth Systematic Missions	9ES14 Green	10ES10 Yellow	ES-11-10 Yellow	ES-12-9
Performance Goal 2.1.5.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.5: "Improve understanding of the roles of the ocean, atmosphere, land and ice in the climate system and improve predictive capability for its future evolution.")						
APG 2.1.5.1: ES-13-9	Demonstrate planned progress in understanding the roles of ocean, atmosphere, land, and ice in the climate system and improving predictive capability for future evolution. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs	9ES15 Green	10ES11 Green	ES-11-11 Green	ES-12-10
Performance Goal 2.1.5.2††	By 2015 launch at least three missions in support of objective 2.1.5.						
APG 2.1.5.2: ES-13-10	Complete the Ice, Cloud, and Land Elevation Satellite-2 (ICESat-2) Critical Design Review.	Earth Science	Earth Systematic Missions	9ES16 Yellow	10ES12 Green	ES-11-14 Yellow	ES-12-13
Performance Goal 2.1.6.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.6: "Characterize the dynamics of Earth's surface and interior and form the scientific basis for the assessment and mitigation of natural hazards and response to rare and extreme events.")						

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### FY 2013 PERFORMANCE PLAN

FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
APG 2.1.6.1: ES-13-11	Demonstrate planned progress in characterizing the dynamics of Earth's surface and interior and forming the scientific basis for the assessment and mitigation of natural hazards and response to rare and extreme events. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Earth Science	Multiple Programs	9ES17 Green	10ES13 Green	ES-11-15 Green	ES-12-14
Performance Goal 2.1.6.2††	By 2015, launch at least one mission in support of objective 2.1.6.						
APG 2.1.6.2: ES-13-6	Launch the Landsat Data Continuity Mission (LDCM).	Earth Science	Earth Systematic Missions	9ES11 Green	10ES08 Green	ES-11-8 Green	ES-12-7
Performance Goal 2.1.7.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.1.7: "Enable the broad use of Earth system science observations and results in decision-making activities for societal benefits.")						
APG 2.1.7.1: ES-13-12	Advance at least 25 percent of decision-support projects one Applications Readiness Level. The Applications Readiness Level is a nine-stage index for tracking the advancement of an Earth science applications project along a continuum from initial concept through development and transition to operational use.	Earth Science	Applied Sciences	9ES18 Green	10ES14 Green	ES-11-16 Green	ES-12-15
APG 2.1.7.1: ES-13-13	Increase the number of science data products delivered to Earth Observing System Data and Information System (EOSDIS) users.	Earth Science	Earth Science Multi-Mission Operations	9ES19 Green	10ES15 Green	ES-11-17 Green	ES-12-16
APG 2.1.7.1: ES-13-14	Maintain a high level of customer satisfaction, as measured by exceeding the most recently available federal government average rating of the Customer Satisfaction Index.	Earth Science	Earth Science Multi-Mission Operations	9ES20 Green	10ES16 Green	ES-11-18 Green	ES-12-17
Outcome 2.2	Understand the Sun and its interactions with the Earth and the solar system.						
Performance Goal 2.2.1.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.2.1: "Improve understanding of the fundamental physical processes of the space environment from the Sun to						

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## FY 2013 PERFORMANCE PLAN

FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
	Earth, to other planets, and beyond to the interstellar medium.”)						
APG 2.2.1.1: HE-13-1	Demonstrate planned progress in understanding the fundamental physical processes of the space environment from the Sun to Earth, to other planets, and beyond to the interstellar medium. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Heliophysics	Multiple Programs	9HE1 Green	10HE01 Green	HE-11-1 Green	HE-12-1
APG 2.2.1.1: HE-13-2	Achieve mission success criteria for the Solar Dynamics Observatory (SDO).	Heliophysics	Living with a Star	None	None	None	None
Performance Goal 2.2.1.2††	By 2015, launch two missions in support of objective 2.2.1.						
APG 2.2.1.2: HE-13-3	Complete integration of the payload to the Magnetospheric Multiscale (MMS) satellite #1 (of four).	Heliophysics	Solar Terrestrial Probes	9HE2 Green	10HE02 Green	HE-11-2 Green	HE-12-2
Performance Goal 2.2.2.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.2.2: “Improve understanding of how human society, technological systems, and the habitability of planets are affected by solar variability interacting with planetary magnetic fields and atmospheres.”)						
APG 2.2.2.1: HE-13-2	Achieve mission success criteria for the Solar Dynamics Observatory (SDO).	Heliophysics	Living with a Star	None	None	None	None
APG 2.2.2.1: HE-13-4	Demonstrate planned progress in understanding how human society, technological systems, and the habitability of planets are affected by solar variability interacting with planetary magnetic fields and atmospheres. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Heliophysics	Multiple Programs	9HE6 Green	10HE06 Green	HE-11-4 Green	HE-12-4
Performance Goal 2.2.2.2††	By 2015, launch two missions in support of objective 2.2.2.						
APG 2.2.2.2: HE-13-3	Complete integration of the payload to the Magnetospheric Multiscale (MMS) satellite #1 (of four).	Heliophysics	Solar Terrestrial Probes	9HE2 Green	10HE02 Green	HE-11-2 Green	HE-12-2
Performance Goal 2.2.3.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of						

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FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
	objective 2.2.3: “Maximize the safety and productivity of human and robotic explorers by developing the capability to predict extreme and dynamic conditions in space.”)						
APG 2.2.3.1: HE-13-5	Demonstrate planned progress in maximizing the safety and productivity of human and robotic explorers by developing the capability to predict the extreme and dynamic conditions in space. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Heliophysics	Multiple Programs	9HE8 Green	10HE08 Green	HE-11-5 Green	HE-12-5
Performance Goal 2.2.3.2††	By 2017, launch at least two missions in support of objective 2.3.2.						
APG 2.2.3.2: HE-13-6	Complete the Solar Orbiter Collaboration Mission Confirmation Review.	Heliophysics	Living with a Star				
Outcome 2.3	Ascertain the content, origin, and evolution of the solar system and the potential for life elsewhere.						
Performance Goal 2.3.1.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.3.1: “Inventory solar system objects and identify the processes active in and among them.”)						
APG 2.3.1.1: PS-13-1	Demonstrate planned progress in inventorying solar system objects and identifying the processes active in and among them. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Planetary Science	Multiple Programs	None	None	PS-11-1 Green	PS-12-1
Performance Goal 2.3.1.2††	By 2017, launch at least two missions in support of objective 2.3.1.						
APG 2.3.1.2: PS-13-2	Initiate the preliminary design for the Discovery 12 mission.	Planetary Science	Discovery	None	None	None	PS-12-3
APG 2.3.1.2: PS-13-5	Complete the OSIRIS-REx Preliminary Design Review (PDR).	Planetary Science	New Frontiers	None	10PS04 Green	PS-11-3 Green	PS-12-2
Performance Goal 2.3.2.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.3.2: “Improve understanding of how the Sun’s family of planets, satellites, and minor bodies originated and evolved.”)						

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FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
APG 2.3.2.1: PS-13-3	Demonstrate planned progress in understanding how the Sun's family of planets, satellites, and minor bodies originated and evolved. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Planetary Science	Multiple Programs	9PS1 Green	10PS01 Green	PS-11-4 Green	PS-12-4
Performance Goal 2.3.2.2††	By 2015, launch at least three missions in support of objective 2.3.2.						
APG 2.3.2.2: PS-13-4	Launch the Lunar Atmosphere and Dust Environment Explorer (LADEE).	Planetary Science	Lunar Quest	None	None	None	PS-12-6
APG 2.3.2.2: PS-13-5	Complete the OSIRIS-REx Preliminary Design Review (PDR).	Planetary Science	New Frontiers	None	10PS04 Green	PS-11-3 Green	PS-12-2
Performance Goal 2.3.3.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.3.3: "Improve understanding of the processes that determine the history and future of habitability of environments on Mars and other solar system bodies.")						
APG 2.3.3.1: PS-13-6	Demonstrate planned progress in understanding the processes that determine the history and future of habitability of environments on Mars and other solar system bodies. Progress relative to the objectives in NASA's 2010 Science Plan will be evaluated by external expert review.	Planetary Science	Multiple Programs	9PS8 Green	10PS09 Green	PS-11-8 Green	PS-12-7
Performance Goal 2.3.3.2††	By 2015, launch at least two missions in support of objective 2.3.3.						
APG 2.3.3.2: PS-13-7	Complete the Mars Atmosphere and Volatile Evolution Mission (MAVEN) Pre-Ship Review (PSR).	Planetary Science	Mars Exploration	None	10PS08 Green	PS-11-10 Green	PS-12-9
Performance Goal 2.3.4.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.3.4: "Improve understanding of the origin and evolution of Earth's life and biosphere to determine if there is or ever has been life elsewhere in the universe.")						
APG 2.3.4.1: PS-13-8	Demonstrate planned progress in understanding the origin and evolution of life on Earth and throughout the biosphere to determine if there is or ever has been life elsewhere in the universe. Progress relative to the objectives in NASA's 2010	Planetary Science	Multiple Programs	9PS5 Green	10PS07 Green	PS-11-11 Green	PS-12-11

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Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
	Science Plan will be evaluated by external expert review.						
Performance Goal 2.3.5.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.3.5: “Identify and characterize small bodies and the properties of planetary environments that pose a threat to terrestrial life or exploration or provide potentially exploitable resources.”)						
APG 2.3.5.1: PS-13-9	Demonstrate planned progress in identifying and characterizing small bodies and the properties of planetary environments that pose a threat to terrestrial life or exploration or provide potentially exploitable resources. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Planetary Science	Multiple Programs	9PS9 Green	10PS10 Green	PS-11-12 Green	PS-12-12
Performance Goal 2.3.5.2	Return data for selection of destinations in order to lower risk for human space exploration beyond low Earth orbit.						
APG 2.3.5.2: PS-13-10	Demonstrate planned progress in characterizing potentially hazardous objects that are possible destinations for future human space exploration.	Planetary Science	Multiple Programs	None	None	None	PS-12-13
Outcome 2.4	Discover how the universe works, explore how it began and evolved, and search for Earth-like planets.						
Performance Goal 2.4.1.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.4.1: “Improve understanding of the origin and destiny of the universe, and the nature of black holes, dark energy, dark matter, and gravity.”)						
APG 2.4.1.1: AS-13-1	Demonstrate planned progress in understanding the origin and destiny of the universe and the nature of black holes, dark energy, dark matter, and gravity. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Astrophysics	Multiple Programs	9AS1 Green	10AS01 Green	AS-11-1 Green	AS-12-1
APG 2.4.1.1: AS-13-2	Achieve mission success criteria for the Fermi Gamma-ray Space Telescope.	Astrophysics	Physics of the Cosmos	None	10AS04 Green	None	None
Performance	Provide national scientific capabilities through necessary skilled						

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Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
Goal 2.4.2.1††	researchers and supporting knowledge base. (In support of objective 2.4.2: “Improve understanding of the many phenomena and processes associated with galaxy, stellar, and planetary system formation and evolution from the earliest epochs to today.”)						
APG 2.4.2.1: AS-13-3	Demonstrate planned progress in understanding the many phenomena and processes associated with galaxy, stellar, and planetary system formation and evolution from the earliest epochs to today. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Astrophysics	Multiple Programs	9AS6 Green	10AS09 Green	AS-11-3 Green	AS-12-3
Performance Goal 2.4.2.2††	Design and assemble the James Webb Space Telescope (JWST).						
APG 2.4.2.2: JWST-13-1	Initiate James Webb Space Telescope Backplane Support Frame Assembly.	James Webb Space Telescope	James Webb Space Telescope	9AS4 Green	10AS06 Green	JWST-11-1 Green	JWST-12-1
Performance Goal 2.4.2.3††	Develop and operate an airborne infrared astrophysics observatory.						
APG 2.4.2.3: AS-13-4	Complete the Systems Requirement Review (SRR) for the initial second generation Stratospheric Observatory for Infrared Astronomy (SOFIA) instrument.	Astrophysics	Cosmic Origins	9AS5 Yellow	10AS07 Yellow	AS-11-4 Green	AS-12-4
Performance Goal 2.4.3.1††	Provide national scientific capabilities through necessary skilled researchers and supporting knowledge base. (In support of objective 2.4.3: “Generate a census of extra-solar planets and measure their properties.”)						
APG 2.4.3.1: AS-13-5	Demonstrate planned progress in generating a census of extra-solar planets and measuring their properties. Progress relative to the objectives in NASA’s 2010 Science Plan will be evaluated by external expert review.	Astrophysics	Multiple Programs	9AS7 Green	10AS10 Green	AS-11-5 Green	AS-12-5
APG 2.4.3.1: AS-13-6	Achieve mission success criteria for the Kepler mission.	Astrophysics	Exoplanet Exploration	9AS8 Green	None	None	None
<b>Strategic Goal 3</b>	<b>Create the innovative new space technologies for our exploration, science, and economic future.</b>						
Outcome 3.1	Sponsor early stage innovation in space technologies in order to improve the future capabilities of NASA, other government agencies, and the aerospace industry.						

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FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
Performance Goal 3.1.1.1	Develop and advance space technologies that support NASA's science, exploration and discovery missions.						
APG 3.1.1.1-ST-13-1	Research, study, or develop concepts for 100 technologies as documented in technology reports or plans.	Space Technology	Crosscutting Space Technology Development	None	None	ST-11-6 Green	ST-12-1
Outcome 3.2	Infuse game changing and crosscutting technologies throughout the Nation's space enterprise, to transform the Nation's space mission capabilities.						
Performance Goal 3.2.1.1	Develop and advance space technologies that support NASA's science, exploration, and discovery missions.						
APG 3.2.1.1-ST-13-2	Complete three feasibility studies, ground demonstrations, or laboratory experiments proving the technical feasibility of new space technologies.	Space Technology	Crosscutting Space Technology Development	None	None	ST-11-7 Green	ST-12-7
APG 3.2.1.1: ST-13-3	Implement at least one new small satellite mission that was initiated in FY 2012 and demonstrate game changing or crosscutting technologies in space.	Space Technology	Crosscutting Space Technology Development	None	None	None	ST-12-9
APG 3.2.1.1: ST-13-4	Implement at least three Technology Demonstration Missions (TDM) technology development projects that were initiated in the previous two years.	Space Technology	Crosscutting Space Technology Development	None	None	ST-11-10 Green	ST-12-10
APG 3.2.1.1: ST-13-5	Select and fly technology payloads from NASA, other government agencies, industry, and academia using flight services procured from at least three commercial reusable suborbital or parabolic platform providers.	Space Technology	Crosscutting Space Technology Development	None	None	ST-11-11 Green	ST-12-11
Outcome 3.3	Develop and demonstrate the critical technologies that will make NASA's exploration, science, and discovery missions more affordable and more capable.						
Performance Goal 3.3.1.1	Develop and test technologies that can be used in human exploration missions.						
APG 3.3.1.1: ERD-13-3	Test docking and anchoring techniques for asteroid missions using a prototype crew excursion vehicle, the Multi-Mission Space Exploration Vehicle (MMSEV), moving on an air bearing floor.	Exploration Research and Development	Advanced Exploration Systems				
Performance Goal 3.3.2.1	Develop advanced spacesuits to improve the ability of astronauts to conduct Extra Vehicular Activities (EVA) for in-space operations and surface exploration.						
APG	Test a packaged Portable Life Support System (PLSS) for an	Exploration	Advanced	None	None	ERD-11-	ERD-12-

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Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
3.3.2.1: ERD-13-4	advanced spacesuit in a vacuum chamber.	Research and Development	Exploration Systems			8 Green	9
Outcome 3.4	Facilitate the transfer of NASA technology and engage in partnerships with other government Agencies, industry, and international entities to generate U.S. commercial activity and other public benefits.						
Performance Goal 3.4.1.1	Accelerate the development and adoption of NASA-funded technology through the establishment of cost-sharing partnerships.						
APG 3.4.1.1: ST-13-6	Establish a total of two partnerships with U.S. industry, other U.S. agencies, or other entities to develop technology that supports NASA's missions or national interests.	Space Technology	Partnership Development and Strategic Integration	9IPP2 Green	None	ST-11-14 Green	ST-12-13
<b>Strategic Goal 4</b>	<b>Advance aeronautics research for societal benefit.</b>						
Outcome 4.1	Develop innovative solutions and advanced technologies through a balanced research portfolio to improve current and future air transportation.						
Performance Goal 4.1.1.1	Transfer knowledge to the aviation community to better manage safety in aviation.						
APG 4.1.1.1: AR-13-1	Conduct flight tests to characterize the ice crystal weather environment, which can adversely affect jet engine performance.	Aeronautics	Aviation Safety	None	None	None	AR-12-1
APG 4.1.1.1: AR-13-2	Develop onboard capabilities that aid in-flight decision-making through instantaneous health assessment of aircraft systems.	Aeronautics	Aviation Safety	9AT1 Green	10AT01 Green	AR-11-2 Green	AR-12-2
Performance Goal 4.1.2.1	Demonstrate advanced technologies and solutions to achieve fuel efficient increases in operational performance of the Next Generation Air Transportation System (NextGen) while reducing noise and emissions.						
APG 4.1.2.1: AR-13-3	Conduct human-in-the-loop simulations for taxi operations conformance, which will reduce fuel consumption during movement on the airport surface.	Aeronautics	Airspace Systems	None	None	None	None
Performance Goal 4.1.3.1	Deliver tools, technologies, and knowledge that can be used to more efficiently and effectively design future air vehicles and their components to overcome national performance and						

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FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
	capability challenges.						
APG 4.1.3.1: AR-13-4	Develop, improve, and validate a multi-fidelity toolset to assess the noise characteristics of future subsonic aircraft.	Aeronautics	Fundamental Aeronautics	9AT7 Green	10AT07 Green	AR-11-6 Green	None
APG 4.1.3.1: AR-13-5	Validate high fidelity tools for sonic boom and drag prediction to enable the design of future supersonic air vehicles.	Aeronautics	Fundamental Aeronautics	9AT9 Green	10AT09 Green	AR-11-8 Green	AR-12-10
Outcome 4.2	Conduct systems-level research on innovative and promising aeronautics concepts and technologies to demonstrate integrated capabilities and benefits in a relevant flight and/or ground environment.						
Performance Goal 4.2.1.1	Demonstrate advanced technologies to reduce fuel burn, noise, and emissions for advanced aircraft expected for introduction into the Next Generation Air Transportation System.						
APG 4.2.1.1: AR-13-6	Conduct tests to validate low-noise characteristics of a hybrid wing body aircraft concept.	Aeronautics	Integrated Systems Research	None	None	None	None
APG 4.2.1.1: AR-13-7	Complete flight evaluations to assess the capabilities of the Live, Virtual, Constructive (LVC) distributed simulation environment.	Aeronautics	Integrated Systems Research	None	None	None	None
<b>Strategic Goal 5</b>	<b>Enable program and institutional capabilities to conduct NASA's aeronautics and space activities.</b>						
Outcome 5.1	Identify, cultivate, and sustain a diverse workforce and inclusive work environment that is needed to conduct NASA missions.						
Performance Goal 5.1.1.1	Define and build diverse workforce skills and competencies needed for the Agency's technology development and deep space exploration.						
APG 5.1.1.1: AMO-13-1	Sustain NASA's Innovation Score, as measured by the innovation-related questions in the Employee Viewpoint Survey (EVS), by taking actions like refining and updating human capital policies, programs, and systems to support and encourage innovation to meet NASA's missions.	Agency Management and Operations	Agency Management	9ED5 Green	10ED04 Yellow	AMO-11-2 Green	AMO-12-1

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FY 2013 Performance Plan				Multi-year Performance Data			
Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
Performance Goal 5.1.1.2	Advance a workplace environment that affords Equal Employment Opportunities (EEO) to all employees and takes proactive diversity and inclusion efforts.						
APG 5.1.1.2: AMO-13-2	Sustain five programs and processes designed to proactively prevent discrimination, as outlined in the Model EEO Agency Plan.	Agency Management and Operations	Agency Management	None	10WF01 Green	AMO-11-7 Yellow	AMO-12-7
APG 5.1.1.2: AMO-13-3	Implement three diversity and inclusion capabilities as outlined in the Agency Diversity and Inclusion Strategic Implementation Plan.	Agency Management and Operations	Agency Management	None	10WF02 Green	AMO-11-8 Yellow	AMO-12-8
Performance Goal 5.1.2.1	Assure that students participating in NASA higher education projects are representative of the diversity of the Nation, based on student enrollment data maintained by the U.S. Department of Education's National Center for Education Statistics.						
APG 5.1.2.1: ED-13-1	Provide significant, direct student awards in higher education to (1) racially or ethnically underrepresented students, (2) females, and (3) persons with disabilities at percentages that meet or exceed the national STEM enrollment percentages for these populations, as determined by the most recent publicly available data from the U.S. Department of Education's National Center for Education Statistics for a minimum of two of the three categories.	Education	Multiple Programs	9ED3 Red	10ED03 Yellow	ED-11-1 Yellow	ED-12-1 Yellow
Outcome 5.2	Ensure vital assets are ready, available, and appropriately sized to conduct NASA's missions.						
Performance Goal 5.2.1.1	Through 2015, assure the safety of NASA's activities and reduce damage to assets through the development, implementation, and oversight of Agency-wide safety, reliability, maintainability, and quality assurance policies and procedures.						
APG 5.2.1.1: AMO-13-4	Assure zero fatalities or permanent disabling injuries to the public resulting from NASA activities during FY 2013.	Agency Management and Operations	Safety and Mission Success	None	10SMS01 Green	AMO-11-9 Green	AMO-12-9
APG 5.2.1.1: AMO-13-5	Maintain a Total Case Rate and Lost Time Case Rate that meets the goals of the President's Protecting Our Workers and Ensuring Reemployment (POWER) initiative.	Agency Management and Operations	Safety and Mission Success	None	10SMS01 Green	AMO-11-10 Red	AMO-12-10

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Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
APG 5.2.1.1: AMO-13-6	Reduce damage to NASA assets (excluding launched flight hardware) by two percent during FY 2013, based on a five-year running average (that also excludes launched flight hardware).	Agency Management and Operations	Safety and Mission Success	None	10SMS01 Green	AMO-11-11 Red	AMO-12-11
Performance Goal 5.2.2.1	By 2015, reduce data center energy consumption by 30 percent (from baseline data defined during FY 2012).						
APG 5.2.2.1: AMO-13-7	Implement power metering in 100 percent of NASA data centers.	Agency Management and Operations	Agency IT Services (AITS)	None	None	AMO-11-15 Green	AMO-12-15
Performance Goal 5.2.3.1	Between 2012 and 2016, eliminate obsolete and unneeded facilities and support the elimination of facilities that will not be needed after Space Shuttle retirement.						
APG 5.2.3.1: COF-13-1	Initiate the demolition or disposal of five facilities or structures during 2013 to reduce the Agency's footprint.	Construction of Facilities	Institutional CoF	None	None	COF-11-1 Green	COF-12-1
Outcome 5.3	Ensure the availability to the Nation of NASA-owned strategically important test capabilities.						
Performance Goal 5.3.1.1	Review monthly the current state of the NASA and Department of Defense (DoD) test capabilities and known test requirements and test requests.						
APG 5.3.1.1: SFS-13-1	Incorporate test capability modifications and known test requirements in the yearly Rocket Propulsion Test (RPT) Master Plan update.	Space and Flight Support	Rocket Propulsion Test	9SFS4 Yellow	10SFS09 Yellow	SFS-11-1 Green	SFS-12-1
Performance Goal 5.3.2.1	Ensure that testing capabilities are available to support the research, development, test, and engineering milestones of NASA and Department of Defense (DoD) programs.						
APG 5.3.2.1: AR-13-8	Provide a new engine icing test capability to address the high-altitude engine icing problem encountered by commercial aircraft.	Aeronautics	Aeronautics Test	None	None	None	None
Outcome 5.4	Implement and provide space communications and launch capabilities responsive to existing and future science and space exploration missions.						
Performance Goal 5.4.1.1	Complete objectives for all NASA- managed expendable launches.						

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Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
APG 5.4.1.1: SFS-13-2	Sustain a 100 percent success rate with the successful launch of NASA managed expendable launches as identified on the Launch Services Flight Planning Board manifest.	Space and Flight Support	Launch Services	None	10SFS11 Green	SFS-11-2 Yellow	SFS-12-2
Performance Goal 5.4.1.2	Achieve savings for the Agency through acquisition reforms.						
APG 5.4.1.2: AMO-13-8	Achieve savings in contract costs of \$10 million in FY 2013, using FY 2012 as the baseline from which to measure savings.	Agency Management and Operations	Agency Management	None	None	None	None
Performance Goal 5.4.2.1	Prioritize and complete launch and range complex modernization studies and projects to better enable government and commercial activities at the Kennedy Space Center (KSC) and Cape Canaveral Air Force Station (CCAFS).						
APG 5.4.2.1: ESD-13-3	Complete the transfer of required Space Shuttle Program (SSP) and Constellation Program (CxP) assets to the Exploration Ground Systems (EGS) Program for use by SLS/MPCV at the Kennedy Space Center (KSC).	Exploration Systems and Development	Exploration Ground Systems	None	None	None	None
APG 5.4.2.1: SFS-13-3	Continue to establish and develop 21 <sup>st</sup> Century Space Launch Complex (21 <sup>st</sup> CSLC) partnerships aimed at understanding government and commercial ground processing, launch, and range infrastructure requirements, while implementing the modifications identified during the FY 2011 initiated studies.	Space and Flight Support	21st Century Space Launch Complex	None	None	None	None
Performance Goal 5.4.3.1	By 2014, launch two functionally identical Tracking and Data Relay Satellite (TDRS) communications spacecraft to replenish the existing TDRS System constellation.						
APG 5.4.3.1: SFS-13-4	Prepare TDRS L for its Flight Readiness Review (FRR).	Space and Flight Support	Space Communications and Navigation	9SFS6 Green	10SFS07 Yellow	SFS-11-5 Green	SFS-12-5
Outcome 5.5	Establish partnerships, including innovative arrangements, with commercial, international, and other government entities to maximize mission success.						
Performance Goal 5.5.1.1	Working with the ISS National Laboratory management entity, expand utilization of the ISS by non-NASA organizations.						

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Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
APG 5.5.1.1: ISS-13-8	Facilitate the non-profit organization's (NPO) establishment of the ISS National Laboratory Marketplace to allow researchers and prospective investors to interact and to demonstrate its effectiveness by producing at least one externally funded research agreement.	International Space Station	International Space Station	None	None	ISS-11-6 Green	ISS-12-6
Performance Goal 5.5.2.1	Continue and improve coordination of NASA's international and interagency agreement activities.						
APG 5.5.2.1: AMO-13-9	Implement improved management of existing agreements by incorporating Office of International and Interagency Relations (OIIR)-led interagency agreements into the Agency agreements database (i.e., the Space Act Agreement Maker).	Agency Management and Operations	Agency Management	None	None	AMO-11-18 Green	AMO-12-13
<b>Strategic Goal 6</b>	<b>Share NASA with the public, educators, and students to provide opportunities to participate in our Mission, foster innovation, and contribute to a strong national economy.</b>						
Outcome 6.1	Improve retention of students in STEM disciplines by providing opportunities and activities along the education pipeline.						
Performance Goal 6.1.1.1	Assure the availability and accessibility of NASA's online curricular support and resources to improve educators' STEM content knowledge and enhance student interest and proficiency in STEM disciplines.						
APG 6.1.1.1: ED-13-2	Maintain no fewer than 1,000 online STEM-based teaching tools for K-12 and informal educators and higher education faculty.	Education	Multiple Programs	9ED7 Green	10ED07 Green	ED-11-3 Green	ED-12-3
Performance Goal 6.1.2.1	Focus resources, including content, facilities, and personnel, to improve the impact of NASA's STEM education efforts on areas of greatest national need, as identified in the 2011 NASA Education Design Team report, ensuring that NASA-unique assets are leveraged when conducting direct-service student activities.						
APG 6.1.2.1: ED-13-3	Conduct no fewer than 200 interactive K-12 student activities that leverage the unique assets of NASA's missions.	Education	STEM Education and Accountability	None	None	None	None
Performance Goal 6.1.3.1	Promote equal opportunity compliance and encourage best practices among NASA grant recipient institutions.						

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APG 6.1.3.1: AMO-13-10	Provide equal opportunity assessment and technical assistance, or on-site compliance assessment, at a minimum of two STEM-related programs that receive NASA funding.	Agency Management and Operations	Agency Management	None	10WF11 Green	AMO-11-19 Green	AMO-12-19
Outcome 6.2	Promote STEM literacy through strategic partnerships with formal and informal organizations.						
Performance Goal 6.2.1.1	Increase NASA's engagement in national STEM education policy discussions to improve curricula, inform national standards in STEM subjects, and ensure coordination and sharing of best practices across federal STEM agencies to avoid duplication, overlap, or fragmentation.						
APG 6.2.1.1: ED-13-4	Participate in no fewer than 20 STEM education advisory boards, STEM-related committees, or other events or activities related to national STEM education policy.	Education	Multiple Programs	None	None	None	None
Outcome 6.3	Engage the public in NASA's missions by providing new pathways for participation.						
Performance Goal 6.3.1.1	By 2015, establish an Agency-wide portfolio of participatory engagement opportunities.						
APG 6.3.1.1: AMO-13-11	Evaluate portfolio of participatory engagement activities and establish best practices.	Agency Management and Operations	Agency Management	None	None	AMO-11-20 Green	AMO-12-20
Outcome 6.4	Inform, engage and inspire the public by sharing NASA's missions, challenges, and results.						
Performance Goal 6.4.1.1	Continue to provide opportunities for learners to engage in STEM education through NASA content provided to informal education institutions.						
APG 6.4.1.1: ED-13-5	Maintain the NASA Museum Alliance and/or other STEM Education strategic partnerships in no fewer than 30 states, U.S. Territories and/or the District of Columbia.	Education	STEM Education and Accountability	9ED11 Green	10ED10 Green	ED-11-9 Green	ED-12-9
Performance Goal 6.4.2.1	Use current and emerging communications technologies to reach increasingly broad audiences.						
APG 6.4.2.1: AMO-13-12	Evaluate for effectiveness social media tools the Agency uses to expand public outreach.	Agency Management and Operations	Agency Management	None	None	AMO-11-21 Green	AMO-12-21
Performance Goal	Make available Agency records through the Freedom of Information Act (FOIA) and Privacy Act and Open Gov in						

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Measure #	Description	Contributing Theme	Contributing Program	FY09	FY10	FY11	FY12†
6.4.3.1	accordance with federal laws and regulations.						
APG 6.4.3.1:AMO-13-13	Decrease the Freedom of Information (FOIA) backlog of requests by 10 percent.	Agency Management and Operations	Agency Management	None	None	AMO-11-22 Green	AMO-12-22

†FY 2012 trending is shown as required but ratings data will not be available until close of fiscal year.

†† The Performance Goals in support of Earth Science, Heliophysics, Planetary Science, and Astrophysics themes are distinct activities supporting the scientific objectives established in NASA's [Strategic Plan](#).